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The Arthur E. Mills Memorial Oration.[1]

MEDICINE, POLITICS AND THE LAW.

By the Right Honourable R. G. MENZIES, C.H., Q.C., M.P.,
Prime Minister of Australia.

I THANK you for the great honour you have just conferred upon me. It will be a cherished memory. Its only defect is that it has to be marked by a long speech. For, too late, I have come to the conclusion that no Prime Minister ought to undertake to deliver a substantial memorial address. There may be some happy beings who can sit down for two or three days and do uninterrupted work on such a task, but Prime Ministers are not among them. At the best, they have only the most sadly broken time for reflection, and to achieve continuity of work on a matter which falls outside the day-to-day curriculum of politics is impossible.

I begin with this apology because as I proceed you will detect every symptom of discursiveness. Having thus thrown myself on your understanding and mercy, may I say at once that The Royal Australasian College of Physicians has conferred upon me a great honour and imposed upon me a great responsibility.

[1] Delivered at the annual meeting of The Royal Australasian College of Physicians, Sydney, on May 11, 1955.

It is an honour because this event commemorates the life and work of a great physician and teacher. I did not have the honour of knowing him, but I know many competent judges who did. What I have heard and read about him has created in me the picture of a man of original talent, direct and penetrating methods, wit, scholarship, a high sense of duty and a notable character; a man who left his thumb-print on a generation of doctors, raised standards and stimulated the spirit, and therefore achieved a species of immortality in his own right.

My task is a responsibility because one glance at the list of my preceding lecturers of the past few years has made me more than once ask myself what I am doing in that galley.

I read that the purpose of the Arthur E. Mills Memorial Oration is "the promotion and encouragement of medical education" (on which I must confess my incompetence at once), "and general culture and dissemination of knowledge" (a phrase which gives me a small chance but smaller comfort).

In a genial and expansive moment I chose for my subject "Medicine, Politics and the Law". Here is indeed a wide canvas on which to paint; much too wide, as I now realize, for my pigments or my brush. For the truth is that my title embraces three topics, each of vital importance and each, therefore, deserving of more than sketchy treatment. In this strange, mad, clever, but in many ways uncivilized century, some of the greatest and best things in civil life have been the development and triumphs of curative and preventive medicine, the spread of the rule of law to new

nations, and the adoption in many new areas of the political institutions of democratic self-government.

I will, of course, not undertake a treatise on all three. On the first, medicine, I am an interested but admiring ignoramus. On the seconds, politics, I am an experienced veteran, conscious every time I read a leading article of how little I appear to have learned in a quarter of a century. On the third, the law, I am a lawyer who has forsworn for the nonce the fascinating paths of advocacy, who retains a deep affection for them, and who is already old enough to see special virtues in the advocates of his youth.

What I have to say, therefore, will turn out to be not a scientific survey, but a mixture of autobiography, reflection, hope and explanation.

The Three Professions.

I begin with a short *excursus*. It was truly said: "do men gather grapes of thorns, or figs of thistles?" I like to judge the great professions by considering their finest products, not their worst. There is nothing fundamentally wrong with the tree if the fruit is good.

Take politics. If we give all our time and headlines to the antics of cheap and noisy demagogues, and to occasional outbursts of vulgar abuse in parliamentary debate, we may conclude that politics is rotten, that "politician" should be a term of reproach, and that Parliament ought to be abolished or drastically reformed.

Yet abolition is unthinkable; and Parliament is reformed every three years, anyhow, by you and millions of others, at a general election. The truth is that Parliament should be judged by its best; by the quality of its law-making; by its statesmanship.

To speak of Australia is to speak of men and events too close for detached judgement. But, to take an example, can there be much wrong with politics in Great Britain when we see, in a brief half-century, a Balfour, an Asquith, a Haldane, a Birkenhead, a Milner, a Lloyd George, a Salisbury, a Churchill? Democratic politics may have shown, here and there, folly, corruption, avarice, moral cowardice or gross ignorance. So does mankind, and a representative system may well reflect that fact.

But the glory of democratic self-government is that it has not only lifted the status and expanded the horizons of ordinary men and women, but has also produced some of the greatest and wisest and bravest men of modern times. It is only by remembering this and rejoicing in it that we can hope to escape the deadly cynicism about politics which, with its clammy hand, reduces enthusiasms and discourages generous effort.

And so of medicine. That there are charlatans and rogues and bunglers nobody can deny. But as only aberrations from the standard are news, and vice is more readable than virtue, we hear about them, and we exaggerate them. It is now many years since I discovered that in the great professions (except politics, which, in its nature, must be carried on in the fierce light of publicity), the finest exemplars are frequently the least known and the least advertised. Of no profession are these remarks more true than that of medicine. There have, on the very summit of skill in Australia, been hundreds of medical men of the rarest ability, of the most generous and devoted impulses, great servants of sick humanity, miracles of energy and endurance, without leisure and the regulated life of others, whose very names are, and will continue to be, unknown to the overwhelming bulk of their fellow countrymen. Yet they are the proof of excellence. There can be nothing basically wrong with a profession which produces them.

And so, judging by the best, I turn to my own profession of the law, and to the list, for example, of the Chief Justices of the High Court—Griffith, Knox, Isaacs, Gavan Duffy, Latham, Owen Dixon. It was no mean profession which produced such men, taking their places among the greatest lawyers in the English-speaking world.

Having said this, I propose to say something about the interaction of these great professions, of medicine and politics, of medicine and the law.

Medicine and Politics.

No profession has in modern times made such strides as medicine in skill and in public respect. More than three centuries ago it was possible for Francis Bacon in his "Advancement of Learning" to say: "Medicine is a science which hath been . . . more professed than laboured, and yet more laboured than advanced; the labour having been in my judgement rather in circle than in progression." He may have been right. Certainly less than a century later we find Samuel Pepys describing an operation for the "stone" in terms of sheer barbarism.

For more than two centuries after Bacon the physicians were as busy reducing bodily afflictions by drawing off the patient's blood as they are now busy pouring blood into the patient. Until the biochemists enlightened the twentieth century with their painstaking genius, the sedative drug was the prescription and Nature the healer. Until this modern revolution occurred, surgery, backed by the discovery of anæsthetics and the introduction of antiseptic and aseptic methods, seemed to have taken the lead.

In the present century, the physician, the chemist, the engineer have wrought wonders in preventive medicine, antibiotic and related drugs have eliminated some diseases and drastically reduced the mortality of others; literally millions of lives have been saved which sixty years ago would have been lost.

The effect of all this is, even now, difficult to estimate. That it has been of benefit to mankind is beyond question. That it has added to the problems of politics I have no doubt; for though politicians, having this in common with ordinary mortals, live longer (physically at any rate) than their predecessors of the eighteenth century, they find increasingly that the growth of numbers in the old age groups is proportionately so much greater than that of numbers in the earning and productive age groups that the relation between government social services and the national product is achieving a new significance, bringing with it the most remarkable changes in our social, economic and financial structure.

I was born in 1894. At that time in Australia the average complete expectation of life for a male child was approximately fifty to fifty-one years. But today the average complete expectation of life for a male child is approximately sixty-seven or sixty-eight years.

You will at once perceive the nature of the new social problem. As the average expectation of life rises, so do more and more in percentage of our people live to what we call "the pensionable age", or "the retiring age". And under modern conditions a greater and greater percentage of those of pensionable age take the pension. Twenty years ago the percentage was 33; today it has risen to 40.

As the amount and conditions of pensions become more liberal, so does the financial burden grow. This in its turn involves two things. One is that the taxation burden grows. The other is that the task of increasing production becomes more and more important, because it is only out of the community's production that any government can pay financial benefits. It is trite politico-economic learning that governments are creatures, not creators, and that they can spend nothing which human beings have not earned and produced. If the value of production does not increase in at least the same proportion as the numbers of beneficiaries and the relative payments made to them, then taxation must be increased, with perhaps depressing effects upon production, or payments to beneficiaries must be reduced.

These are simple enough propositions to state. I state them not because I like them, but because I recognize their validity. For my present immediate purpose it is perhaps enough to point out that advances in one science and art, like medicine, must, if the community is to progress, be accompanied by advances in the productive arts and sciences, in the development of power resources, in water engineering, in industrial methods, and, last but not least, in the efficiency of individual effort. These considerations make it abundantly plain that national growth depends upon a realization all through the community that nobody is exempted from the need for effort and improvement.

As I have already established some association between the work of the physician and the problems of the politician, let me develop the nature of the political problem a little more clearly.

There was a time not so long ago when many men thought that it was easy to draw a clear line between matters which it was appropriate for governments to undertake and those which should be left to the ordinary citizen. The consequence of that assumption, put into practice, was that the functions of government were restricted, the burdens of government were light, taxes were almost negligible, great fortunes were made and poverty and misery came to be regarded as the natural lot of a great number of good people.

There were in the nineteenth century notable reformers who set about to change that state of affairs by political and industrial and social action.

The twentieth century has seen the most radical changes. Today many of us, indeed I would hope most of us, still think it important to draw the line, but we no longer think it easy. For the complexities of modern life are astonishing and the methods of democratic self-government inevitably lack subtlety.

Governments and parliaments cannot deal with individuals or exceptional cases except to a minor degree. Parliamentary law has of necessity a fairly rigid form. It deals with people and transactions in the mass. It achieves the paradox of being at one and the same time sharp in its incidence and yet, humanly speaking, a blunt instrument. For example, a law providing for a pension or some other social benefit must have precision when it defines eligibility for grant. This very precision, because it excludes the exceptional case, will exclude some deserving people and include some others whose merits are dubious. Such anomalies cannot be avoided in terms except at the risk of an over-elaboration and over-refinement of definition which in the long run may hurt more than they cure.

The alternative to over-elaboration is to create in the statute a wide area of administrative discretion. This is a process which gives too much uncontrolled power to officials, leads to grave uncertainties and renders it impossible for most people to know or enforce their rights. Government by regulation has been much attacked in recent times as constituting the "new despotism". Sometimes it has been attacked with good reason. But government by administrative discretion is much worse, for it runs counter to all the lessons of history and is deeply opposed to sound democratic theory and practice.

The end result of twentieth century laws and policies is what has been styled the Welfare State, some of the implications of which deserve some clearer public understanding than now appears to exist. The most important practical implication is one to which I have already alluded, but which needs repetition. A community of individuals who expect and receive, at all stages of life, assistance and protection from the State must of necessity, by proper fiscal measures, accept the economic and financial burden of providing that assistance and protection. Many individuals may properly get from government more than they pay to or provide for government; some may even get "something for nothing", though I doubt it. But the sum of what all the individuals get cannot exceed the sum of what all the individuals pay or provide, for government has no money of its own.

This basic truth has been so obscured by cloudy notions about the inexhaustible resources of the disembodied but paternal State that it is frequently forgotten. Common sense and true humanity require that we should remember it.

Let me develop it by illustration.

More and more, in line with humane public opinion, governments have provided more and more things for the citizen which the citizen himself once provided or went without. Examples come readily to the mind: pensions and retiring benefits, hospital treatment, health services, medical schemes, housing, education, child allowances.

The social services expenditure of the Commonwealth Government alone is today of the order of £200,000,000. Just before the war in 1938-1939 it was £17,000,000. And when I mention those figures I have included nothing in respect of migration, repatriation, rehabilitation, the provision of war service homes and many other things, the demand for which and the costs of which are in most cases rising substantially. In addition to such matters, there are great programmes of national development, of capital works, without which we could never provide the necessary foundation for increasing population or for that accelerated production which alone can raise our material standard of living.

Most of us, I fear, take an annual interest in the Commonwealth Budget which confines itself to discovering whether our benefits have been increased or our taxes reduced. It would be a healthy experience for many critics if they had a look at the Estimates of Expenditure which the Budget contains.

I have just been reading the Estimates in the last Budget. They afford a striking answer to the loose observations of people who say, light-heartedly, that the Government ought to cut its expenditure in half and give the taxpayer a chance. (It might be regarded as a cynical observation on my part if I said that quite a few of those who make these demands are to be found the following week joining in a demand upon the Government to spend more money upon something that interests them.)

Roughly, the Commonwealth Government is spending £1,000,000,000 a year. This is the result, to an overwhelming degree, of war and of the social revolution to which I have referred. Its measure may be best understood if I tell you that in 1939, when I was Prime Minister and Treasurer, I introduced at Canberra the first £100,000,000 budget in the history of Australia. On that occasion I pointed out that Mr. Gladstone had commented late in his career that he was introducing the first £100,000,000 budget in the history of Great Britain.

Yet of the £1,000,000,000 there is very little which, under the most drastic circumstances, would lend itself to material reduction. Let me mention some of the items.

We are spending £200,000,000 for defence services—a great sum, it is true; but it represents a smaller percentage of our national income than the defence expenditure of Great Britain, or of Canada, or of the United States, whose dangers in this dangerous world are not to be separated from our own.

We are spending £118,000,000 on past war and present repatriation services. Our payments to the National Welfare Fund for social services are of the order of £200,000,000.

Our payments to or for the States, which themselves have great social and economic responsibiiities, are approximately £200,000,000.

We are spending £100,000,000 on capital works and services which represent the very minimum that must be done if our own developmental responsibilities to the people are to be discharged.

I will not exhaust the list. All I need say to you is that the normal departmental expenditures are something under £50,000,000, or 5% of the entire bill.

What are we to conclude from these matters? Optimism would be carried to excess if we thought that we might expect some sudden change in the world scene which would enable us to get rid of defence expenditure, and so divert into productive channels or remit to taxpayers the vast sums involved.

I do not believe that any sensible observer could doubt that for years to come at least we must accept as part of the burden of our life relatively high levels of taxation. As production grows, as our creation of wealth increases, so we all hope to see the proportionate burden of our taxes reduced. But, reduced or not, they will continue to be relatively high. The effect of high taxation is, of course, to limit personal savings; and, as the personal savings which enabled many people to assure their own independent future, and which provided capital for expansion, become more difficult, so will there be further demands upon governments and upon government action. All these things mark, as I have said, a social revolution. It is idle to

protest against it. It has many aspects which are admirable and some which are magnificent. Our task is to make it work, and not to allow it to develop into a vicious spiral terminating in the elimination of private capital and initiative and the creation of the all-powerful State.

I have dwelt on this point in order to emphasize that we are not just to cry for the "good old days" when governments, so it was said, attended to "their own business". We are to try to weave into this new fabric some of the old virtues and good things which all of us want to preserve. In brief, if governments are to do more and more, let us at least see that they act in such a way as to preserve the greatest measure of independence of spirit, and do not sink into the error of creating a universal feeling of dependence upon government, or a willingness to accept as inevitable the complete regimentation of life by political authority.

You of the medical profession have every reason to be concerned about this problem, and deeply interested in its solution. For whatever the scientists may have discovered about the causes and treatment of disease, whatever the new techniques that have been evolved, whatever the immense subdivision of skills which appears to mark modern times, I affirm my belief that there can be no proper medical service to our people unless it preserves freedom of choice, the personal relationship, and some obligation of self-help. I adhere to my conviction that there is a definite therapeutic value in the confidence of the patient in the doctor of his choice. There are on the doctor's side a potent humanity and a real enhancement of his understanding and skill in the personal knowledge that he has of the patient whose doctor and friend he has frequently been for a long time.

I am very proud of the fact that, after years of conflicting views and sometimes of sharp dispute, my own Government has been able to institute a medical health scheme which, while it brings medical treatment within the reach of everybody, has set out to preserve these precious elements to which I have referred. The whole thing indeed is a splendid example of how by hard work and cooperation between government and profession, the existence of a high degree of government action can be reconciled with the preservation of the private enthusiasm and independent activities of the citizen.

Twenty years ago it was a common experience for me to be told by bankers or by doctors or by many other people of various groups and occupations that they took no interest in politics. More than once I remember replying that the day would come when politics would take an interest in them. That day has come. The fact that it has come does not mean that you must all become politicians in the sense that I am one, engaged in daily controversy, drawn off from private life or private interests, but it does mean that you must all become politicians in the sense that you give serious thought to what I have endeavoured to describe as the great internal problem of our times—the problem of reconciling the growth in the power and responsibility of government with the power and responsibility of private citizens.

Law and Medicine.

So there we have politics and medicine and something of their interrelation. I will now say something about medicine and the practice of the law—about doctors and lawyers.

In my time at the Bar it was my duty to appear fairly frequently in cases in which some doctor was sued for negligence, and quantities of expert evidence were adduced.

If the medical experts of Melbourne did not hate the very sight of people like me, then the agnosticism which used to be regarded by most second-year medical students as a proof of their intellectual emancipation must have given way to a Christian patience of the most exemplary kind. For the cross-examiner who knows his business, cross-examination is the very champagne of forensic life. Its exponents are no doubt born, but they can thereafter be improved.

If by any chance you sit in court and see counsel, nose down, scribbling a close note of what his opposing witness is saying in the box, jumping up to cross-examine, looking at the witness closely for the first time, and then taking the witness right through his evidence again—"Do you swear to that, witness?"—time after time, emphasizing the witness's importance, strengthening his original evidence by repetition, I must tell you that you are watching, despite its noise and apparent emphasis, a classical exhibition of incompetence.

The true cross-examiner, that nonchalant fellow who appears to have nothing on his mind, comes into court after days and nights of preparation. The pleadings have displayed the issues. He has made most of his notes before he ever comes into court. He knows what it is he wants to establish, and what his own material is. So, instead of writing with his nose, he studies his witness. An occasional jotting will remind him of some point which he does not want to forget. But the witness is the thing.

Is he bold and forthcoming? If so, a careful retreat before him may induce him to rush into exaggeration and disaster. The witness whose motto is "I'll show him" is perhaps the easiest of all, for nothing lowers caution half so much as a flushed feeling of victory.

Is he, *per contra*, a timid fellow given to vagueness? No good cross-examiner bullies such a witness and creates for him sympathy in the minds of judge, jury and spectators.

I assure you that the Serjeant Buzfuzes of the Bar get more headlines than they do judgements.

The truth is that the observant cross-examiner makes use of a witness's own characteristics. If he is timid and vague, encourage his vagueness. His evidence may possibly disappear in a mist of uncertainty.

Is the witness called to give expert evidence, opinion evidence? Ah, here is where I come to the ancient conflict between the gentlemen of the long robe and the gentlemen of the long words.

There have been and are glorious exceptions to the sinister but confidential disclosures which I am about to make. But all too frequently what happens is something like this.

Dr. A. is sued by Mrs. B. for damages (say, modestly nowadays, £20,000), for alleged negligent treatment of a fractured elbow joint. Up on the bench there is a judge who, after many years of practice, can detect a liar with reasonable accuracy and hopes that by a process of thought transference the jury will detect him also.

There is a jury of respectable citizens, slightly irritated by being drawn away from more gainful occupations. They can see the plaintiff's crooked arm; they think it is a shame, and they are reminded by a knowing juryman, at the first adjournment, that "these doctors have a defence fund, you know, and they tell me they make tremendous incomes".

Dr. X., a great swell, knowledgeable on bones and joints, is called as an expert. He has been extremely busy and has had either no time or no inclination to refresh his memory on his text-books. But on the whole that does not trouble him; what does a lawyer know of bones and elbow joints anyhow?

Mr. Y., Q.C., is waiting for him. Mr. Y.'s acquaintance with his own elbow is purely functional, but he has devoted a lot of time in conference with other experts to getting up the subject. He has even armed himself with the leading text-books. He is at home in court. It is the witness who occupies the nervous place of novelty under the gaze of the cold legal eye.

Mr. Y., in due course, cross-examines. He gets Dr. X. to a point at which, somewhat rashly, he commits himself to a denial of a particular proposition. He is asked whether he has ever heard of "Jones on Joints". Of course he has.

"Isn't it a work of authority?"

"Of course it is."

"Would he mind looking at page so-and-so of the such-and-such edition?" Up goes the book.

"Read it out to the jury, please, doctor."

He reads it out. It contradicts the evidence he has just given. Agitation, an explanation, a notable decline in the authority of the witness's testimony!

True, if Mr. Y., Q.C., had been up in the box and cross-examined, his own forgetfulness of his legal text-books would at once have become painfully apparent.

But Mr. Y. is not in the box. Dr. X. is.

Mr. Y. is an expert in words.

Dr. X. is an expert in a different field.

I have seen it all happen so frequently, and its moral is obvious enough.

I know, of course, that Dr. X. is a great expert and that if Mr. Y. had some sort of bone trouble he would go to Dr. X. like a shot. But the expert witness who fails to give himself a refresher course of, if you like, an academic kind before submitting himself to cross-examination is looking for trouble.

Now, what I have said may seem to you to expose the cross-examiner to the charge of being more concerned with a meretricious debating triumph than with the attainment of a just result.

But this is not so.

Evidence which is not cross-examined is frequently worthless.

An experienced judge once said: "Truth will out, even in an affidavit!" The fact is that in court both memory and action must be scrupulously examined by the advocates of both sides if a just conclusion is to be reached.

In my close and extensive experience at the Bar I do not think that I ever saw an honest witness brought to ruin; for honesty has a manifest quality of its own which will ultimately shine through hesitations and confusions. But I have seen many smooth liars brought to destruction, and have, indeed, occasionally assisted in that agreeable process. But that these forensic encounters were capable of producing some mutual misunderstandings between lawyers and doctors could hardly be denied.

I know that in Melbourne the establishment of the Medico-Legal Society did much to break down the barriers. My political diversions have for many years prevented my attendance, but I have some happy recollections. Professor F. Wood Jones, the anatomist, gave us a grim but in places hilarious lecture on "judicial hanging", which satisfied his audience that, under common practice, death by hanging had frequently meant death by strangulation. Most of us took a resolution that night to avoid capital crime at all reasonable cost. This lecture, which, as you can see, involved a serious attack upon the mechanism of the law, provoked from Mr. Gorman, a celebrated advocate, a lecture upon a dead but famous anatomist whose success, Mr. Gorman averred, was at least partly the result of a commercial association with a group of body-snatchers. The lawyers present, like many juries before them, thought that Mr. Gorman had established his facts and had made out his case. This brought Wood Jones to his feet, in a spate of anger and of generous emotion, to vouch for the character and conduct of the great man, whom he had admired so much. Up rose Charles Gavan Duffy, the Victorian Supreme Court Judge, and with him the Duffy wit. "It all reminds me", he said, "of a case in the Court of Petty Sessions at Collingwood, where the boot and shoe industry prevails. The defendant, a young man, was accused of stealing a pair of boots. The police gave evidence which appeared complete. Defendant's counsel called (somewhat irregularly, perhaps) evidence of good character from two clergymen, a schoolmaster, and some other respectable citizens. The magistrate, a wise and perceptive man, like me, gave his judgement. He said: 'In this case the unchallengeable evidence satisfies me that a young man of impeccable character has undoubtedly stolen a pair of boots!' "

I apologize for this frivolous aside and return to my theme—the relation between the lawyer and the doctor. For the true object of the true lawyer is justice; justice according to the law; the application of the rules of law to facts affirmed, cross-examined, established, fearlessly and objectively. That is the justice to which the medical man, a defendant to some action, is entitled. Do our present methods reasonably guarantee such justice to him? Speaking not as a Prime Minister, but as a lawyer, I take leave to doubt it. It is one of the oddities of human nature that those we fly to most readily for help in time of trouble, or for protection against the threat of future trouble, are frequently those whom we abuse most roundly when all seems well. It is not uncommon to hear lawyers described as sly and cunning cynics, whose prospects of a satisfactory hereafter are dim. Yet they are the first resort of those in trouble or difficulties, and are the trusted custodians of the confidences and secrets of many thousands. And this is even more true of doctors. But let a doctor be accused of negligence, and sued in damages, and some juries will (or did, in my experience) give a verdict against him, and damage his reputation, on the earthy principle that "the plaintiff is a poor and suffering soul and could do with the money".

The whole point about British justice is that it is justice according to the law. *Lex est rex.* It is not to be swayed by passion or prejudice or admirable but irrelevant social motives.

I believe in juries in criminal cases, for they acquit unless satisfied beyond reasonable doubt, and a layman is as qualified to have reasonable doubts as any lawyer. But where the issues involve the examination of highly technical problems, as in an action of negligence against a doctor, I would take leave, impertinently, to believe that a judge, accustomed to understanding new bodies of knowledge and to a judicial consideration of them, would produce a sounder justice according to the law. Juries are an admirable and worldly-wise instrument in libel, in slander, in all matters in which the sensible judgement of ordinary men is, in reality, the standard of judgement at which the law aims. But in complicated technical matters, I doubt whether the jury is truly "the palladium of English Liberty".

Conclusion.

Well, I have come to an end. I am sorry to have taken so long, and, as I fear, to have said so little. But if anything I have said has increased in any way "the dissemination of knowledge"—I say nothing of "general culture"—then the purpose of the establishment of this memorial to a great and good and wise man will not have been entirely defeated.

HÆMOLYTIC DISEASE OF THE NEWBORN DUE TO A B O ISOSENSITIZATION IN ASSOCIATION WITH POTENT ANTI-M AGGLUTININS.

By ELIZABETH PREST, J. A. BONNIN, R. T. SIMMONS AND B. T. J. NEWLAND.

From the Red Cross Blood Transfusion Service (South Australian Division), the Institute of Medical and Veterinary Science, Adelaide, and the Commonwealth Serum Laboratories, Melbourne.

HÆMOLYTIC DISEASE of the newborn due to incompatibility between the A B O blood groups of mother and fœtus occurs about once in every 2000 births (Mollison, 1954). It is therefore approximately one-tenth as common as the disease due to anti-Rh. Dienst (1905) first demonstrated that fœtal A or B antigenic material could enter the maternal circulation to produce immunization in women who lacked these antigens. Ottenburg (1923) suggested that *icterus neonatorum* might be caused by such a blood group incompatibility, and many probable instances of the disease have since been described (Wiener, Sonn and Hurst, 1946; Polayes and McNally, 1948; Grumbach and Gasser, 1948). Definite evidence for the ætiological role of anti-A and anti-B antibodies was presented by Boorman, Dodd and Trinick (1949), and by Mollison and Cutbush (1949). These authors carried out red cell survival studies by a modified Ashby technique (Dacie and Mollison, 1943) and directly demonstrated the shortened survival time of normal group A erythrocytes transfused to affected group A infants. Since then it has been possible to present proven cases with their clinical and laboratory findings.

A B O sensitization has tended to be overlooked in South Australia because of a general unawareness of its existence

and of the methods for its diagnosis, and because of inadequate laboratory facilities for the investigation of blood grouping problems. Although this disease is one-tenth as common as that due to anti-Rh, only two cases have been definitely established in this State to our knowledge, compared with over 200 instances of hæmolytic disease due to Rh antibodies. It is therefore the purpose of the present paper to draw attention to A B O sensitization, to report an interesting case, and to indicate briefly the clinical aspects and laboratory aids to diagnosis.

Report of a Case and Serological Findings.

The blood groups of the family concerned are shown in Table I. The first two pregnancies resulted in healthy children. The third baby was born at term in May, 1952. It lived only a few minutes, making violent but unsuccessful respiratory efforts. An autopsy revealed œdema of the subcutaneous tissues, and a considerable quantity of jaundiced fluid in the pleural and peritoneal cavities. There was gross œdema of the glottis, which completely obstructed the respiratory tract. Examination of sections of the liver showed the presence of small foci of extramedullary hæmatopoiesis.

The patient lived some 290 miles from Adelaide and the baby's blood was not grouped. The father's blood group was AB, Rh-negative. The mother's serum was examined after her delivery and was found to contain anti-M agglutinins to a titre of 128 and, subsequently, a high titre of anti-B agglutinins. No anti-Rh agglutinins were detected. Anti-M agglutinins as a cause of the suggested erythroblastosis were regarded with suspicion, and an A B O incompatibility was considered more likely, although the diagnosis of hæmolytic disease of the newborn was never definitely established.

The fourth baby was born on April 7, 1954. During the pregnancy, serological investigations on the maternal serum revealed the following information. On December 11, 1953 (at twenty weeks' gestation), anti-M agglutinins were detected to a titre of 8·0 (all titres are expressed as the reciprocal of the final dilution of serum at which agglutination or hæmolysis was detected). On February 5, 1954, anti-M agglutinins were detected to a titre of 16. On March 18 the titre had risen still further to 64, anti-B agglutinins were found to a titre of 64 and anti-B hæmolysins were present to a titre of 32.

After the birth of the child, a sample of cord blood was examined and later sent to Adelaide. The blood group was A, Rh (D) positive. The direct Coombs test produced a negative result. The hæmoglobin value was 10 grammes per 100 millilitres. In contrast, the hæmoglobin estimation performed on blood obtained by puncturing the heel was 14·5 grammes per 100 millilitres. A smear made from the cord blood at the time of collection and examined two days later contained no recognizable microspherocytes. However, a smear made from the oxalated cord blood did show the presence of microspherocytes, but as the specimen was then thirty-six hours old, it was thought that little reliance could be placed on this finding.

On the third day of life the baby weighed only four pounds 12·5 ounces. Shortly after birth it became jaundiced, and on the following day it was suspected that excessive hæmolysis was occurring. Two simple transfusions were given, one on the sixth and a second on the seventeenth day; but the baby died on the nineteenth day. No autopsy was performed.

When the baby was found to be of blood group A, the maternal serum was examined for the presence of immune anti-A antibodies. Agglutinins were present to a titre of 256 and hæmolysins to a titre of 8·0. Blood samples from all members of the family were sent to Melbourne nine days after the patient's delivery, and the following results were obtained by one of us (R.T.S.).

The family blood groups are shown in Table I.

In the maternal serum, anti-A and anti-B agglutinins were present to a titre of 256. After "partial neutralization" with A and B substances, immune anti-A and anti-B antibodies were each detected to a titre of 128 by the indirect Coombs test. With type MN red cells suspended in glucose-citrate solution, anti-M agglutinins were demonstrated in saline dilutions at 20° C. to a titre of 16. When type MM erythrocytes were used, the titre was 64. There was no saline agglutination with these cells at 37° C., and the indirect Coombs test, performed strictly at this temperature, gave a negative result. However, when group OM red cells were suspended in 25% human albumin and added to dilutions of the maternal serum made in normal group AB serum, agglutination occurred at 37° C. to a titre of 64.

The baby's red cells were weakly agglutinated with anti-A serum, and normally agglutinated with group O serum. Washing the cells did not greatly improve the agglutination with anti-A serum. The Coombs test result was negative. An attempt to elute antibodies from the red cells by heating them to 56° C. was unsuccessful.

In the baby's serum, anti-M agglutinins were found present to the same titre as in the maternal serum.

Discussion.

It therefore appears that the third baby was affected by hæmolytic disease of the newborn due to immune anti-B antibodies, and the fourth baby by the disease due to immune anti-A antibodies. In both instances these immune antibodies were associated with a potent anti-M agglutinin, probably of the naturally-occurring type. This antibody was essentially a cold agglutinin and did not sensitize type M red cells at 37° C. when tested by anti-globulin serum. The fact that it became active at 37° C. against red cells suspended in 25% human albumin does not necessarily indicate an immune type of antibody. In this case, as in another in which potent anti-M agglutinins were present, it is considered that the activity at 37° C. is indicative of a potent cold agglutinin with a high thermal amplitude rather than of an immune antibody. It is interesting to note that this naturally-occurring cold antibody freely passed the placental barrier.

Jakobowicz and Bryce (1951) recorded four patients in whose sera anti-M agglutinins were found, and in one of these the antibody was able to permeate the placenta. Simmons (1955) found two instances of anti-M agglutinins which were active at 37° C., and in neither case throughout several pregnancies was there any evidence of hæmolytic disease.

In the maternal serum, the rising titre of anti-M agglutinins as the pregnancy progressed may be ascribed to a non-specific stimulation (Jonsson, 1936). However, the tests were not standardized by the use of erythrocytes from the same donor, and therefore the results are not strictly reliable.

Comments on Hæmolytic Disease Due to A or B Sensitization.

Ætiology.

The disease occurs in the group A or B babies of group O mothers. Jakobowicz and Bryce (1948) demonstrated that anti-A and anti-B agglutinins occurred more frequently in cord blood when the mother was of group O than when she was of group A or B. They suggested that the anti-A and anti-B agglutinins in group O blood were not identical with those in group B or group A blood, although their action on human red cells was similar.

TABLE I.
Family Blood Groups.

Subject.	Group.							
	A B O.	MNS.	Rh.	C^w.	P.	Le^a.	Fy^a.	K.
Mr. R.	A_2B	MNss	rr'	−	−	−	+	−
Mrs. R.	O	Nss	R^1R^2	−	+	−	+	−
Baby I born March, 1949	A_2	Nss	R^1r	−	−	−	+	−
Baby II born July, 1950	B	Nss	R^2r	−	−	−	+	−
Baby III born May, 1952	No blood grouping test performed.							
Baby IV born April, 1954	A_2	MNss	R^1r	−	−	−	−	−

Recently Wiener (1953) and Wiener and Wexler (1954) have put forward an attractive hypothesis which supports this suggestion and explains the restriction of this disease to the children of group O women. They postulated the existence of a third major blood group factor "C", which is present in association with both A and B factors. Hence group A and group B individuals may be considered to contain A + C and B + C factors respectively, and therefore they would be capable of developing only true anti-B and anti-A antibodies. Group O individuals, on the other hand, who lack all three factors, develop not only anti-A and anti-B but also anti-C antibodies. It is these immune anti-C antibodies which Wiener and others postulate as giving rise to hæmolytic disease of the newborn. This theory would certainly explain the gross differences between the behaviour of the so-called naturally-occurring and immune varieties of anti-A and anti-B antibodies.

Clinical Picture.

The clinical picture is similar to that of the disease produced by Rh antibodies, although it is unlike it in that the first baby is commonly affected, the anæmia is usually less severe and the prognosis is better. However, Bryce, Jakobowicz and Turner (1952) have recorded the fatal termination of a first pregnancy resulting from A B O incompatibility. In this family the third baby was also severely affected, but an excellent result was obtained from a timely exchange transfusion. Mild cases are probably considered as unusually severe examples of "physiological jaundice", or the jaundice is explained on the grounds of prematurity. In more severe instances there may be miscarriages, stillbirths, hydrops fœtalis or the birth of an œdematous or anæmic infant. There may be a yellowish discoloration of the cord, an enlarged liver or spleen, or cerebral signs associated with kernicterus, such as a shrill cry or convulsions.

Diagnosis.

In Rh incompatibility, the presence of anti-Rh antibodies in the maternal serum will indicate, in the majority of instances, a potentially affected fœtus. This is not true in A B O incompatibility. Most group O women will become sensitized during a heterospecific pregnancy and will develop immune anti-A or anti-B antibodies, but only a small proportion will give birth to affected infants. In practice, the disease is usually anticipated only because of previous poor obstetric histories, as described above.

Frequently the diagnosis cannot be made on clinical grounds at birth, when the policy of treatment must be decided upon. However, laboratory investigations on the cord blood are all-important in assisting diagnosis and determining treatment. It is here emphasized that cord blood should be collected from the umbilical vein with a needle and dry syringe, and not expressed from the severed ends of the cord. Blood which flows from the cord will often be diluted with tissue fluids and Wharton's jelly, which may produce grossly fallacious results, both in hæmoglobin determinations and in blood grouping. A properly collected specimen of cord blood is the most reliable material for an early hæmoglobin estimation. Mollison (1951) has recorded the large discrepancy between the hæmoglobin estimations performed on venous blood or cord blood samples and on blood obtained by skin puncture (heel puncture). This discrepancy is unexplained, and may be as great as three grammes of hæmoglobin per 100 millilitres of blood (compare the discrepancy of 4·5 grammes per 100 millilitres between the hæmoglobin value of the expressed cord blood sample and that obtained from heel puncture in the present case). The falsely high figures obtained by skin puncture persist for the first week of life, gradually approximating the figures obtained from venous specimens over the first ten days. These falsely high figures obtained from the skin punctures at birth were responsible for the earlier belief that there was a rapid destruction of red cells during the first few days of life. It is now known that such abnormal red cell destruction does not occur.

Mollison (1951) gives the following figures for the hæmoglobin values on the first day of life: cord blood, 13·6 to 19·6 grammes per 100 millilitres; venous blood, 14·5 to 22·5 grammes per 100 millilitres; heel puncture, 15·5 to 23·0 grammes per 100 millilitres. There are some 250 millilitres of blood in the normal fœtal circulation and another 100 millilitres in the placenta at birth. The majority of the red cells in the placenta are transferred to the baby when the arteries to the placenta shut down, while the fluid is eliminated. This results in the high hæmoglobin value of the baby's venous blood, and as the amount received from the placenta is variable, cord blood is the only reliable material on which to estimate the degree of anæmia.

The laboratory diagnosis of hæmolytic disease of the newborn due to anti-A and anti-B antibodies may be considered under two headings: (*a*) the investigations which reveal the presence of a hæmolytic process, and (*b*) those which reveal the presence of immune anti-A or anti-B antibodies which could be responsible for the hæmolytic process.

In the first instance, all the criteria of hæmolysis must be sought. In the cord blood, a hæmoglobin value below 13·6 grammes per 100 millilitres, a serum bilirubin level above three milligrammes per 100 millilitres, a raised reticulocyte count and the presence of more than 10 nucleated red cells per 100 leucocytes are all significant findings. In addition, the Coombs test result is frequently negative, and microspherocytes are commonly evident in stained blood films; both these findings serve to distinguish this condition from the disease due to Rh and the less common Kell and Kidd antibodies. The presence of a spherocytic change will be associated with an increased osmotic fragility of the baby's red blood cells.

Whenever this disease occurs, the immune anti-A or anti-B antibodies can invariably be demonstrated in the maternal serum, and they will always hæmolyse the baby's red blood cells. According to Mollison, hæmolysins should be present to a minimum titre of 4. In addition, there is usually a high titre of anti-A or anti-B saline agglutinins. When increasing quantities of the appropriate A or B substances are added to immune anti-A or anti-B sera, the hæmolytic properties of the sera are first lost, and then follows loss of ability to agglutinate appropriate red cells in saline dilutions. At this point the sera will still agglutinate red cells suspended in group AB serum and will sensitize erythrocytes to agglutination by antiglobulin serum (Witebsky, 1948; Ervin, Christian and Young, 1950). This phenomenon is known as "partial neutralization".

Therefore, the presence of immune anti-A or anti-B antibodies in the serum of a pregnant group O woman who has a suggestive obstetric history, for which no other cause can be found, must be regarded with suspicion. Should these findings be accompanied at delivery by clinical or laboratory evidence of hæmolysis, the presence of spherocytes and a negative response to the Coombs test in a properly collected cord blood specimen, the diagnosis is established.

Treatment by Exchange Transfusion.

The indications for treatment and the treatment of this disease are the same as those of hæmolytic disease due to anti-Rh. An adequate exchange transfusion may be life-saving in severe cases. Group O blood of the same Rh group must be used. It should contain a low titre of anti-A and anti-B agglutinins and must be free of potent hæmolysins. Walker and Murray (1954) have reduced the mortality of live babies suffering from hæmolytic disease of the newborn to 2%. Their criteria for the institution of exchange transfusion are as follows: a cord blood hæmoglobin value below 14·8 grammes per 100 millilitres, or a cord blood hæmoglobin value between 14·9 and 17·7 grammes per 100 millilitres associated with a serum bilirubin level above 2·7 milligrammes per 100 millilitres. No infant with a hæmoglobin value greater than 17·7 grammes per 100 millilitres was given an exchange transfusion. After this procedure, the necessity for subsequent simple transfusions is not common. In either case, the baby's hæmoglobin level should be watched carefully during the first few weeks of life. The treatment of associated prematurity and other conditions is not considered in this paper.

Laboratory Techniques: Examination for Immune Anti-A or Anti-B Antibodies.

Partial Neutralization.—Tests for partial neutralization (Crawford, Cutbush, Falconer and Mollison, 1952) are carried out as follows:

Suspensions (2%) of fresh washed group A_1 or group B erythrocytes are made in normal saline solution and in AB serum. Doubling dilutions of the test serum are made in saline and in AB serum. All reagents are then placed in a water bath at 37° C. An equal volume of the saline red cell suspension is added to each of the saline serum dilutions, and similarly the cells suspended in AB serum are added to the dilutions of test serum in AB serum. After one hour at 37° C. the tubes are examined for agglutination. If an immune antibody is present, there will usually be a higher titre of agglutination in AB serum than in saline. The A or B substances present in group AB serum may occasionally interfere with this test.

Next, one volume of the test serum (0·25 millilitre) is added to each of three tubes eight millimetres in diameter. Half a volume of commercial A and B substance is added to the first tube, an equal volume to the second tube, and two volumes to the third tube. Half an hour at room temperature is allowed for neutralization to occur. The contents of these tubes are then tested for saline anti-A or anti-B agglutinins by the addition of equal volumes of the 2% saline suspensions of group A_1 or group B erythrocytes to a portion of each. The degree of agglutination is recorded after one hour at room temperature.

A and B substances will readily neutralize the naturally-occurring cold anti-A and anti-B agglutinins, but will neutralize the immune antibodies only with difficulty. Therefore, to demonstrate the presence of immune antibodies, the serum is selected which has had the minimum amount of A and B substance added to abolish the saline agglutinins. This partially neutralized serum may then be examined for immune anti-A and anti-B agglutinins by repeating the original titrations in saline and group AB serum. If these immune antibodies are present, they will usually be detected in the serum dilutions. Alternatively, an indirect Coombs test may be performed on group A_1 or group B erythrocytes sensitized in this partially neutralized serum for one hour at 37° C.

When the Coombs test, both direct (on cord blood) and indirect, is being performed for the detection of sensitization by anti-A and anti-B antibodies, full strength Coombs reagent (rabbit anti-human-globulin serum) and also saline dilutions of the reagent 1 in 4, 1 in 16 and 1 in 64 should be used. The reason for this is that the optimum dilution for the demonstration of sensitization by Rh antibodies as recommended with a commercial reagent may not be the optimum for other types of sensitizing antibodies. If this procedure is adopted, it must be stressed that carefully controlled tests with the same sensitized and non-sensitized red cells are especially necessary.

Should commercial A and B substances not be available, saliva from a known group A or group B secretor may be used. Approximately 10 millilitres of freshly collected saliva are placed immediately in a boiling water bath for twenty minutes to inactivate enzymes. The boiled saliva is then centrifuged to clear it. The anti-A or anti-B agglutinins in the test serum are titrated in saline dilutions as previously. The test serum is then diluted with saline until its titre of agglutination is reduced to 64. An equal volume of boiled saliva should contain sufficient A or B substance to neutralize the naturally-occurring anti-A or anti-B agglutinins contained in the diluted serum.

The Titration of Hæmolysins.—The technique is based on that described by Dacie and de Gruchy (1951). Fresh normal group O serum must be obtained which is free or almost free from anti-A and anti-B hæmolysins. This fresh serum supplies complement. Serial doubling dilutions of the test serum are made in the fresh normal group O serum ranging from 1 in 2 to 1 in 128. Small tubes containing 0·25 millilitre of the serum dilutions are then placed in a water bath at 37° C. Fresh group A or group B erythrocytes are washed three times in normal saline and a 30% saline suspension of the packed cells is prepared. One drop volume (approximately 0·03 millilitre) of the erythrocyte suspension is added from a Pasteur pipette to each serum dilution. In addition, tubes containing group A or group B erythrocytes in the normal group O serum, and group O erythrocytes in the test serum, are included as controls. All tubes are incubated at 37° C. for one hour, during which time they are tapped at least once to disperse any heavily agglutinated red cell clumps. They are then lightly centrifuged and the degree of hæmolysis in the supernatant fluid is compared with that (if any) occurring in the tube containing the normal serum control. Immune anti-A and anti-B antibodies are always associated with potent hæmolysins. Larger volumes—for example, 0·5 millilitre volumes of serum dilutions and two drops of erythrocyte suspension—may be used if found more convenient.

Summary.

Hæmolytic disease of the newborn due to A or B sensitization is discussed, with particular reference to the laboratory aspects of diagnosis and the criteria for treatment by exchange transfusion.

Two fatal cases of hæmolytic disease of the newborn in successive pregnancies are recorded. The first was thought to be due to immune anti-B antibodies, and the second to immune anti-A antibodies, occurring in a group O woman. These antibodies were accompanied by a potent anti-M agglutinin, which was probably of a naturally occurring variety.

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BARIUM ENEMA REDUCTION OF INTUSSUSCEPTION IN INFANCY.[1]

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IN recent years, more and more conditions have been coming into the surgeons' domain It is therefore of interest to find, in the treatment of intussusception in infancy, a swing away from surgery. This trend has been brought about by the increasing use of the procedure of barium enema reduction. Whilst in no way jeopardizing the case for surgery, or delaying operation to any extent, the barium enema method is successful in many cases and has other advantages which will be explained later.

Some eighteen months ago it was decided to give this method of treatment a clinical trial at the Royal Children's Hospital, Melbourne. Although some overseas authorities have suggested its use in all cases, and even as a diagnostic procedure in abdominal pain in infancy, it was decided in this investigation to restrict the trial to cases in which the disease was relatively mild and the history short. Only one patient with abdominal distension has been submitted to the procedure.

During the last eighteen months, 60 patients with intussusception have been admitted to this hospital. Of these, 41 patients have been given a barium enema (two-thirds of the total number); in 24 of these the intussusception has been reduced, in 17 it was not reduced, and in two it has recurred. The proportion of cases in which reduction was effected was therefore 24 out of 41. Whenever possible, the patients with non-reduced intussusception were followed up at operation, and in almost all cases it was found that the operative reduction was difficult. Even in these "failed" cases the intussusception was always partly reduced, which made the surgeon's task easier, and the amount of handling of bowel appreciably less. The average duration of the history in the cases of non-reduction was almost twice that of those in which reduction was completely effected by barium enema; this emphasized the importance of early diagnosis and admission of the patient to hospital. In those cases in which the intussusception was reduced by a barium enema, the length of stay in hospital averaged about twenty-four hours, and the infants went home perfectly well with unscarred abdomens. Of the two recurrences, one took place within twenty-four hours and the other a month later. Both patients were submitted to operation without a further barium enema.

The main points in the actual procedure are as follows. The baby is first treated for shock which may be present, and during its stay in the radiological department every effort is made to keep it warm and comfortable. On its arrival in the department, a Foley bag catheter is inserted into the rectum and the bag is inflated with some 20 cubic centimetres of water. The can containing the barium mixture is raised to three feet above the height of the baby, warmed barium solution being used to allay shock. The baby's buttocks are firmly held together by a nurse (always a different one), and the barium is allowed to run in under fluoroscopic control. The importance of firm pressure on the buttocks cannot be over-stressed, as without this the baby may be unable to retain the enema. "Spot" films are taken of the progress of the reduction, and a final film is taken to confirm the complete reduction by the presence of barium in the small bowel. If the first attempt is not successful after a few minutes of hydrostatic pressure, two further attempts may be made, the enema can being lowered below the baby and the barium siphoned off after each attempt. Whether the intussusception is reduced or not, as much barium as possible is siphoned off at the end of the procedure. It must be stressed that at no time is abdominal palpation allowable during the giving of the enema. After a successful reduction the baby is given two charcoal tablets, and if these are not passed in six to eight hours a plain enema is given to prove the absence of any obstruction. If the procedure is unsuccessful, the baby is taken to the operating theatre for immediate operation.

Some criticism of this method of treatment has been raised on the ground that there is a risk of perforation if the bowel has become gangrenous. Experimental work has been carried out which shows that, if the bowel is gangrenous in intussusception, a hydrostatic pressure of three feet is insufficient to reduce the gangrenous areas and so expose it to the direct pressure effect. It is therefore thought that no risk of perforation exists if the hydrostatic pressure is not elevated above the figure quoted here.

In conclusion, the following advantages can be enumerated:

1. In comparison with the plain water enema, the great advantage of the barium enema is visualization of the actual reduction.

2. In regard to operation (which this barium enema reduction complements rather than supplants), it may be said that when the method is succesful the enema obviates anæsthetic risk and post-operative complications, and the baby leaves hospital in a much shorter time. When it is unsuccessful the enema does not cause a long delay before operation can be performed, nor does it interfere with the surgeon's procedure.

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[1] Read at a meeting of the Australasian College of Radiologists, Melbourne, November 18, 1954.

INFECTIONS CAUSED BY A PARTICULAR PHAGE TYPE OF STAPHYLOCOCCUS AUREUS.

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WIDESPREAD outbreaks of staphylococcal infection occurring as definite clinical entities and associated with a particular type of *Staphylococcus aureus* have been rarely recorded. One reason for this rarity may be that phage typing and serological typing as methods of differentiating strains of staphylococci have not been widely used, and in many countries phage typing has only recently been introduced. On the other hand, observations by Williams, Rippon and Dowsett (1953) and by Rountree (1953) suggested that, with a few exceptions, no particular phage type appeared more likely than any other to cause a particular type of lesion.

However, Krag Andersen (1943) reported that outbreaks of *pemphigus neonatorum* in Denmark were caused by a particular serological type, and in Norway a widespread outbreak of puerperal mastitis was shown by Oeding (1952) to be due to a single serological type. The strains isolated in this Norwegian epidemic were penicillin-resistant and also caused infections of the newborn. Similarly, in Canada (Colbeck, 1949; Webb, 1954) numerous cases of puerperal mastitis and breast abscesses occurred between 1947 and 1951, and were due to several closely related penicillin-resistant strains. Infections of the newborn also occurred in the Canadian epidemic.

Isbister, Durie, Rountree and Freeman (1954) recently described the occurrence in a hospital in Sydney of skin infections of the newborn caused by a particular phage type of *Staph. aureus*, and gave reasons for considering this to be an "epidemic" strain. Infections with this strain, which was numbered provisionally 52AV and has now been given the number 80, apparently commenced in July, 1953. However, the strain was differentiated with certainty only in November, 1953, when a phage (80) lysing it specifically was isolated. These strains are lysed only by this phage 80, but belong to the broad phage group I. The majority are penicillin-resistant.

These type 80 strains have persisted up to the present time in the hospital in which they were originally isolated. In addition, during 1954, numerous staphylococcal cultures were received in this laboratory from outbreaks of neonatal sepsis occurring throughout Australia, and the majority of these have proved to be type 80. There is evidence of the appearance and increasing incidence of strains of this type among adult patients admitted to Royal Prince Alfred Hospital with severe staphylococcal lesions or attending the casualty department. There is also evidence that the strain is the cause of an epidemic of furunculosis in the staff of this hospital.

For these reasons, it seems of importance to record observations on the incidence and geographical distribution of this strain in Australia.

Infections at the Royal Prince Alfred Hospital.

Phage typing has been in use in this hospital during the past six years, and during this period all cultures of *Staph. aureus* isolated in the routine laboratory have been typed. It has in this way been possible to obtain information on the frequency distribution of the broad phage groups in all types of infection, and on the incidence of particular strains (Rountree, 1953). While a certain proportion of staphylococci are not lysed by the typing phages, this proportion is low in severe infections. Furthermore, only five of 88 strains isolated from boils between October, 1948, and July, 1953, were not typable with the phages then in use, which did not include phage 80. Similarly, only four of 39 strains examined from various lesions occurring in the hospital staff during 1953 could not be typed. It is therefore thought unlikely that any considerable numbers of occurrences of the new type were missed in these earlier years by being classified as not typable.

TABLE I.

Monthly Incidence of Infections with Type 80 Staphylococci at Royal Prince Alfred Hospital from November, 1953, to December, 1954.

Month.	Staff.	Out-Patients and Casualty Patients.	In-Patients.		Total Number of Infections.
			On Admission.	Infected in Hospital.	
1953—					
November ..	—	—	2	—	2
December ..	1	—	—	—	1
1954—					
January ..	2	—	—	1	3
February ..	1	1	—	—	2
March ..	4	4	8	3	19
April ..	2	1	2	1	6
May ..	—	2	4	1	7
June ..	2	3	2	3	10
July ..	2	2	1	4	9
August ..	3	1	2	3	9
September ..	4	4	6	4	18
October ..	4	5	2	9	20
November ..	8	4	7	10	29
December ..	10	10	5	9	34
Total number	43	37	41	48	169

In November, 1953, phage 80 was introduced into our routine set of typing phages, and the monthly incidence thereafter of persons with lesions due to type 80 is shown in Table I. During the fourteen months ending December, 1954, strains of this type were isolated from 169 infected persons. The number of lesions from which the strain was isolated is greater, since a number of people suffered from recurrent lesions. However, each person infected has been counted only once in the compilation of the table.

Incidence of Infection in the Hospital Staff.

Forty-three members of the staff had lesions caused by type 80. In February, 1954, one nurse suffering from recurrent boils was identified as being infected with this strain. Her first boil had occurred in September, 1953, and the strain then isolated was recorded as not typable. It is considered that this was probably the first occurrence of the strain in the nursing staff. In January, 1955, this nurse was still having boils and was a nasal carrier of the strain.

Throughout 1954, the numbers of newly infected persons varied from one to four each month until each of the last two months of the year, when 10 members of the staff were infected.

During 1954, staphylococci were isolated from 50 boils occurring in the staff, and 35 of them were type 80. This predominance of one type among the strains from boils is very different from that previously found (Rountree, 1953), when many different phage patterns were isolated although strains belonging to the broad phage group II accounted for 50% of the lesions. The remainder of the strains from boils in 1954 comprised many different patterns.

It seems justifiable to regard the greatly increased incidence of cases of furunculosis and the predominance of one type among these cases as indicative of the presence in the staff of a highly infective staphylococcus.

Infections in Patients.

No strains of type 80 were isolated from casualty patients and out-patients between November, 1953, and January, 1954, the first strain being found in February. From then onwards there was a steady monthly incidence of the strain until December, when 10 persons presented themselves at the casualty department with lesions due to type 80. Throughout the year it was noteworthy that the majority (32 out of 37) of isolations of the strain were made from casualty patients rather than from out-patients.

Among the in-patients, two infections were detected in November, 1953; one was an acute *otitis media* and the other a pulp space infection of the hand progressing to osteomyelitis. However, it is not possible to be certain that earlier cases did not occur and remain undetected. What is certain is that no further patients were admitted to hospital with the infection until March, 1954. Thereafter there was a steady monthly incidence of patients admitted with various types of lesion.

In addition, the strain also appeared in March as a cross-infecting organism in surgical wounds, and approximately half the in-patients infected acquired their infections in hospital. Particularly interesting were seven patients who had carbuncles or crops of boils while being treated for other conditions, and who had been in the wards for some time before these lesions appeared; the first of these occurred in January.

The appearance of the strain as a cross-infecting organism is clearly correlated with its presence in the nursing staff and in patients admitted to hospital with infections.

Clinical Observations on the Infections.

The types of lesion from which all the strains examined were obtained will be given in detail in a later section of this paper; but at this point some observations on certain types of infection seen in the nursing staff and patients may be of interest.

The clinical superintendent (Dr. J. Richards) states that he has no difficulty in differentiating the type 80 infections when they appear as crops of boils or as single boils. The infection usually appears as a pustular folliculitis which is soon followed by the development of boils, usually with a black spot in the centre of the lesion and accompanied by much œdema of the underlying tissues. In several cases there has been widespread cellulitis; in others, large carbuncles have developed. The clinical picture is of a much more severe infection than that normally seen in furunculosis and is often accompanied by toxæmia. Many of the nurses affected have suffered from recurrent crops of boils, some lasting for nearly twelve months.

Among the nurses, and also among patients admitted to hospital, there were several with pulp or palmar space infections following small lacerations of the hand. These infections developed with great rapidity after the initial injury. Progression of the infection to tenosynovitis and

osteomyelitis occurred in several people and resulted in permanent damage to the fingers.

Attention must also be drawn to a number of cases of pneumonia in which the only ætiological agent isolated was this strain of *Staph. aureus*. It is likely that the initiating infective agent may have been an influenza virus, since the means of identifying influenza viruses were not available. An association of group I strains with fulminating influenzal pneumonia was noted in England in 1949 (Williams, *et alii*, 1953).

One patient in our series was a female, aged eighteen years, who was admitted to hospital on July 6, 1954, with a diagnosis of pneumonia. The patient's illness had commenced seven days previously with a sore throat and cough. These were followed two days later by pain in the chest and dyspnœa; on the following day small hæmoptyses commenced. On her admission to hospital the patient had a temperature of 103° F., was slightly cyanosed and delirious and had blood-stained sputum loaded with staphylococci. Death occurred forty-eight hours later with toxæmia and circulatory failure. No attempt to isolate influenza virus from this patient was possible; but it is probable that her initial infection was influenzal, as clinically diagnosed cases of the disease were occurring in Sydney at this time.

Relationship of the Infections to the Nasal Carrier State.

Previous work has shown that there is a correlation between the frequency distributions of the various phage groups of staphylococci isolated from the noses of normal persons and from lesions (Rountree, 1953; Williams *et alii*, 1953).

A survey of blood donors made in Sydney in March and April, 1954 (Rountree, Freeman and Barbour, 1954) showed that 98 of 200 people were carrying *Staph. aureus* in their noses. However, none of these was carrying a strain of type 80. In casualty patients at this hospital in the four months from November, 1953, to February, 1954, only one strain of type 80 was identified among 36 strains of *Staph. aureus* isolated, and this strain occurred in February. From March to December, 31 (18%) of 172 strains were of this type. These observations suggest that the organism was not widely seeded in the general population of Sydney before March, 1954, and that its incidence increased thereafter.

Surveys of the nasal carrier rates among the nursing and medical staff of this hospital were carried out in September, October and November, 1953, and again in November, 1954. In Table II the frequency distributions in the various phage groups are shown for the staphylococci isolated in these two surveys, and also for the strains isolated from lesions in the staff between November, 1952, and November, 1953, and between November, 1953, and December, 1954. The organisms are divided into penicillin-sensitive and penicillin-resistant categories.

The penicillin-sensitive strains, in spite of small numbers, show reasonably good agreement between the distributions in noses and in lesions. On the other hand, while the penicillin-resistant strains show agreement in 1952-1953, in the following period there is a wide discrepancy between the distributions of group I and group III strains in noses and in lesions. Of the penicillin-resistant strains isolated from lesions, 55% belonged to group I, compared with 13·1% found in the noses. Thirty-seven of these group I strains were of type 80. If these infections are removed from the total, the distribution becomes similar to that observed in 1952-1953.

This wide discrepancy can be readily explained on the assumption that the type 80 strains have a greater tendency to produce lesions than is possessed by those strains that were previously found in the noses of the staff.

At the same time, there is evidence that infections with this strain may not necessarily be accompanied by nasal carriage. We have no data on a large series of pairs of nasal swabs and swabs from lesions taken at the same time, but the type 80 strain was not present in the noses of seven out of 13 people at times when they were suffering from boils. Furthermore, two persons cured of their nasal carrier state by courses of appropriate antibiotics continued to have lesions, indicating that the strain was established on the skin surface. These findings resemble those obtained by Roodyn in England (1954). However, they do not mean that nasal carriage is not important in the perpetuation of the infections, since in some people it is an obvious mechanism by which the skin may be reinfected or by which infection may be transferred to other people.

Neonatal Infections Throughout Australia.

Information received from various sources indicates that there has been a considerable number of outbreaks of neonatal infection in maternity hospitals throughout Australia during the past eighteen months. Exact information on the incidence of infection is difficult to obtain, since skin lesions in the newborn are not notifiable to public health authorities; but it seems that many hospitals have experienced cases of staphylococcal infection that were recognized as more severe than those to be normally expected in nurseries for the newborn.

TABLE II.

Frequency Distribution of the Phage Groups of Staphylococci Isolated from Nasal Carriers and from Lesions in the Staff of Royal Prince Alfred Hospital.

Phage Group.	November, 1952, to October, 1953.		November, 1953, to December, 1954.	
	Noses.	Lesions.	Noses.	Lesions.
Penicillin-Sensitive.				
I	24	10	7	11
II	12	4	6	11
III	44 (39·6%)	2	9 (30·0%)	9
IV	—	—	—	—
Miscellaneous ..	—	—	1	2
Not classifiable ..	8	1	3	2
Not typable ..	23	4	4	3
Total number of strains ..	111	21	30	38
Penicillin-Resistant.				
I	25 (14·5%)	2	15 (13·1%)	44 (55·0%)
II	3	—	—	2
III	110 (63·9%)	16	85 (74·6%)	27 (33·7%)
IV	—	1	1	1
Miscellaneous ..	—	—	1	—
Not classifiable ..	16	2	3	4
Not typable ..	18	1	7	2
Total number of strains ..	169	22	114	80

During 1954, strains from outbreaks in 24 hospitals were examined and 19 proved to be due to type 80. Of the five remaining episodes of infection, two occurred in New Zealand, one involved only one mother and her baby, and the fourth in Bairnsdale, Victoria, was caused by a strain belonging to phage group I and closely related to type 80. The fifth outbreak occurred in Adelaide at the same time as two type 80 outbreaks, and has been described by McCartney and McLean (1954). The following is a list of the localities in which these type 80 outbreaks occurred:

New South Wales:
Sydney (five hospitals), Bathurst, Blayney, Dubbo, Goulburn, Griffith, Maitland, Penrith, Young.

Victoria:
Melbourne.

South Australia:
Adelaide (two hospitals).

Western Australia:
Perth.

Queensland:
Warwick.

New Zealand:
Oamaru.

It is unlikely that this is an exhaustive list of the outbreaks that occurred in 1954, since many hospitals may be unaware of the value of phage typing in tracing the sources of these infections. (Many of the cultures we received came through personal contact with pathologists or health departments.) The continent-wide distribution of the type 80 strains in these neonatal infections is nevertheless remarkable.

The type of skin lesion caused by this organism in the newborn has been described by Isbister *et alii* (1954). Breast abscesses of the newborn have also been observed. In addition, seven out of eight cultures obtained from cases of empyema in young infants during the last four months of 1954 were cultures of this organism. Three of these babies died. It would be of interest to know whether there has been an increased incidence during the past year of the more serious types of staphylococcal infection, such as pyothorax, osteomyelitis and septicæmia, in young infants admitted to children's hospitals in Australia.

It should be noted that mothers of the infected babies are liable to develop interstitial mastitis which progresses to a breast abscess unless appropriate antibiotic therapy is administered promptly. In all hospitals where the outbreaks have been adequately investigated, there have been histories of furunculosis among the nursing staff, and nasal carriers of the strain have been detected. While a general spring-cleaning of hospital nurseries and appraisal of details of the handling of the babies are always advisable after such outbreaks, it has been found on a number of occasions that such measures are insufficient to eliminate the infections should a carrier of the strain remain on the staff. However, when such carriers have been detected and treated, the infections have come to an end.

Antibiotic Sensitivity of Type 80 Strains.

The results of antibiotic sensitivity tests on 329 strains of this type are given in Table III, which includes strains from nasal carriers as well as lesions. Of 190 strains isolated at this hospital, 92·4% were penicillin-resistant.

TABLE III.

Antibiotic Sensitivity of Type 80 Strains Isolated in Various Places.

Antibiotic Sensitity.	Royal Prince Alfred Hospital.	Other Hospitals.
Sensitive to penicillin, streptomycin, chloramphenicol and tetracycline	15 (7·6%)	5 (3·6%)
Resistant to penicillin, sensitive to other antibiotics	148 (78·2%)	129 (92·8%)
Resistant to penicillin and streptomycin	19 (10·0%)	3 (2·2%)
Resistant to penicillin, streptomycin and tetracycline	7 (3·7%)	1 (0·7%)
Resistant to penicillin and tetracycline	1 (0·5%)	1 (0·7%)
Total number	190	139

Most of the 15 penicillin-sensitive strains were isolated early in 1954, and since then the strains have been consistently resistant. The strains from other hospitals were those obtained from all other sources in Australia for which full information on sensitivities was available. It will be seen that only 3·6% of these 139 strains were penicillin-sensitive. It can be concluded that penicillin will be of little or no value in infections with this strain of staphylococcus.

A number of strains resistant to streptomycin as well as to penicillin was isolated in this hospital. The majority of these came from infections contracted in one particular ward, where they were initiated by a patient who had the streptomycin-resistant organism in his sputum on admission to hospital, and who had received streptomycin therapy.

Up to the present time there have been few strains resistant to the tetracyclines as well as to penicillin and streptomycin; but it may be expected that the number will increase in the future.

Types of Lesion Associated with Type 80 Strains.

Table IV shows the types of lesion from which 274 type 80 strains were isolated. The 66 strains isolated from infants compared with 208 from adults do not necessarily reflect the relative incidence of infection in these two groups. In a number of outbreaks of neonatal infection only one or two cultures were obtained, although there were histories of many more babies having been infected prior to investigation. It will be seen that in the babies the strain tended to cause skin infections rather than conjunctivitis. This had already been noted at the Royal North Shore Hospital by Isbister *et alii* (1954).

TABLE IV.

Types of Lesions from which Type 80 Strains have been Isolated.

Subjects and Nature of Lesions.	Number.
Babies:	
Abscesses and skin pustules	53
Conjunctivitis	4
Ear infections	1
Pyothorax	7
Infected wound	1
Total	66
Adults:	
Boils, carbuncles and abscesses	65
Pustules on skin	5
Cross-infected surgical wounds	40
Infected cuts and wounds	48
Breast abscesses	22
Septicæmia	1
Urinary tract infections	3
Conjunctivitis	4
Pneumonia	15
Ear infection	5
Total	208

In adults, boils, carbuncles, breast abscesses and infected cuts and wounds accounted for the majority of the infections. There was one case of septicæmia which occurred in a woman three weeks after her delivery and followed the initial lesion of a boil on the labium. There was one case of meningitis following infection of a leucotomy wound, the organism being isolated from the wound. Both these patients recovered with appropriate antibiotic therapy.

Discussion.

The information recorded in this paper regarding this particular strain of *Staph. aureus* suggests that it is a strain of more than ordinary virulence.

The evidence in favour of its enhanced virulence is partly clinical and partly epidemiological. The skin lesions caused by the strain in adults and in infants were frequently more severe than those normally seen. Its occurrence in pyothorax of young infants seems also of significance. From the epidemiological point of view, its predominant incidence in outbreaks of neonatal infection suggests not only a wide distribution of the organism in Australia, but also a particular ability to attack the skin of the newborn. In the nursing and medical staff of Royal Prince Alfred Hospital examination of the frequency distributions of this strain and of the various phage groups of staphylococci in noses and lesions revealed a wide discrepancy between the carrier rates and the lesions. Since it has been generally assumed—and there is recent evidence (Valentine and Hall-Smith, 1952; Tulloch, 1954) to support this assumption—that the source of the organisms causing boils in adults is the anterior nares of the patient, the poor correspondence between the nasal

flora of our staff and that of their lesions suggests that the type 80 infections were superimposed on the normal stratum of autogenous infections to be expected in any group of people. Indeed, if the type 80 infections are subtracted from the total infections, the frequency distribution then becomes similar to that previously found in lesions and to that present in the noses.

It may be that this strain is one of which the population has not had any previous immunological experience, and it could be argued that this is the only factor contributing to the severity of the lesions. While it must be admitted that our knowledge of the immunity mechanisms in staphylococcal infection is still scanty, one of the characteristics of the present organism is its ability to produce continued lesions in individuals, some of whom are known to have had persistent infections for more than twelve months, and this would appear to favour the idea of increased virulence rather than lack of immunity in the host.

Whether in fact strains of this type are endowed with characters conferring enhanced virulence which may be identified *in vitro* or in experimental animals is a problem for further investigation.

The origin of the strain in Australia is a matter for speculation. It is not the one that was responsible for the Canadian or Norwegian epidemics of puerperal mastitis, and Dr. R. E. O. Williams (personal communication) states that phage 80 lyses specifically few of the strains isolated from recent neonatal infections in the United Kingdom. The strain may have been present for some time without being detected, but from its increasing incidence in Sydney during 1954 this seems unlikely. In Maitland, infections corresponding clinically to those shown in November, 1954, to be type 80 commenced in the middle of 1953, and it is also possible that similar infections occurred in some hospitals in Melbourne during that year. In another maternity hospital in Sydney, cases of skin infection commenced in November, 1953, and in March, 1954, type 80 was isolated from the lesions. Retrospective inquiry is of no great value in establishing an exact date for the appearance of the strain; but the small amount of evidence available suggests that the strain appeared some time in 1953.

This strain may have arisen by mutation from a previously existing strain of lower virulence; but whatever its origin, its ability to produce penicillinase and to cause skin lesions more readily than other strains normally found in carriers would confer on it characters well suited to its survival and spread. The frequent exchanges of nursing and medical staff between cities in the various States and between city and country hospitals could provide a method for the dissemination of the strain in maternity hospitals.

Finally, it must be emphasized that this strain is not the only one that can cause neonatal infections, nor the only one that is the cause of recurrent furunculosis. Previously, the predominance of group II staphylococci as a cause of boils in Australia was reported (Rountree, 1953) and infections with group II strains are still occurring. The type 80 infections seem to be superimposed on those previously found.

Summary.

During 1954, strains of a new phage type of *Staph. aureus* were isolated in increasing numbers from patients at Royal Prince Alfred Hospital, Sydney.

The strain was the cause of an epidemic of furunculosis in the staff of the hospital.

The strain was also the causative organism in 19 out of 24 outbreaks of neonatal staphylococcal infections occurring in hospitals throughout Australia. It was isolated chiefly from skin lesions in the newborn, but also from seven out of eight infants with pyothorax.

Evidence is presented for regarding this staphylococcus as one of enhanced virulence.

Of all cultures of this strain, 94% were penicillin-resistant.

Acknowledgements.

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RAPID SLIDE AGGLUTINATION BY LEPTOSPIRAL ANTIBODIES.

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THE conventional agglutination test (Schuffner and Mochtar, 1927) for leptospirosis becomes somewhat unwieldy and time-consuming when it is desired to use a wide variety of serotypes against a large number of sera, for several culture tubes of each serotype and numerous porcelain plates are required.

In an endeavour to overcome these difficulties, various methods have been evolved with the use of formalin-treated standardized suspensions of leptospires prepared in bulk, and relative stability for these—up to fifteen months—has been claimed (Pot, 1936; Brown, 1939; Stoenner, 1953; Schoenherr, 1953; Hoag, Gochenour and Yager, 1953).

However, as has been pointed out (Gardner, 1947), these methods require special preparation and standardization, and appear to show little justification for departure from the well-established original technique, for they are both less specific and less sensitive.

The main disadvantage in the use of living cultures is their infectivity; but as the virulence of freshly isolated strains is known to be rapidly lost on subculture, this becomes negligible.

Difficulties reported concerning the maintenance of strains in culture and the determination of titre end-points ("end agglutination") with them, seem unconvincing and rather exaggerated; moreover, it is now almost universally accepted that the use of living suspensions results in more sensitive reactions—evinced by higher end-point titre—than the use of formalinized suspensions. The publication (Kruger, 1953) of a rapid slide method with the use of live leptospires, seems to offer possibilities for the economical performance of surveys when large numbers of sera are involved; it is desired to use as wide a range as

possible of antigens whilst at the same time conserving material and shortening the reading time required for titre determination.

TABLE I.

Serogroup of Leptospira.	Serotype.[1]	Homologous Rabbit Antiserum Titre.
icterohæmorrhagiæ	*icterohæmorrhagiæ* (Jackson)	1:30,000
	pomona (Staines)	1: 3000
	hyos (syn. *mitis*) (Johnson)	1: 3000
	grippotyphosa (Moscow V, Bernkopf)	1:10,000
australis A	*australis A* (Ballico)	1: 3000
pyogenes	*pyrogenes* (Salinem)	1:10,000
	australis B (Zanoni)	1: 3000
	(" Robinson ")[2]	1: 3000
	canicola (Berlin Hond)	1:10,000
hebdomadis	*medanensis* (" Ives ")[2]	1: 3000
	(" Szwajizak ")[2]	1:10,000
	(" Kremastos ")[2]	1: 3000
	(" Celledoni ")[2]	1: 3000

[1] Strain name in parentheses.
[2] Compare Smith *et alii* 1954.

Since 250 tests only in which this slide method was used have been reported, the value of the technique appears to

TABLE II.

Results of 808 Leptospiral Tests Performed on Slide and Plate.

Results of 808 Tests on Serum.	Positive Results.		Negative Results.	
	Slide.	Plate.	Slide.	Plate.
217 tests on cattle serum	102 (47%)	93 (43%)	115 (53%)	124 (57%)
591 on human serum	228 (38%)	191 (32%)	363 (62%)	400 (68%)
Total	330 (41%)	284 (35%)	478 (59%)	524 (65%)

be somewhat speculative. It was therefore decided to conduct further investigation along these lines, with

TABLE III.

Distribution of 330 Positive Slide Results Among the Serotypes.

Leptospiral Serotype.	Serum Dilutions (330). 1:30.			1:100.			1:300.			1:1000 or Higher.		
	+[1]	=[1]	−[1]	+	=	−	+	=	−	+	=	−
icterohæmorrhagiæ	10	21	1	0	4	0	0	1	0	0	0	0
pomona	7	16	2	0	9	0	2	6	0	0	6	0
hyos (syn. *mitis*)	1	10	0	1	13	0	0	4	0	0	1	0
grippotyphosa	1	5	1	0	6	0	1	2	1	0	1	0
australis A	12	7	0	7	4	0	1	2	0	1	2	0
australis B	5	17	0	1	5	0	0	2	0	0	0	0
" Robinson "	1	6	0	2	0	0	0	1	0	0	0	0
pyrogenes	5	7	1	1	3	0	0	1	0	0	1	0
canicola	0	6	0	0	1	0	0	0	0	0	0	0
medanensis	1	13	1	1	6	0	0	1	0	0	1	0
" Szwajizak "	0	19	3	3	13	0	0	3	0	0	0	0
" Kremastos "	2	15	1	0	6	0	0	1	0	0	0	0
" Celledoni "	1	2	1	0	1	0	0	0	0	0	0	0
Total (330)	46	144	11	16	71	0	4	24	1	1	12	0
	201			87			29			13		

[1] " + ", slide titre one dilution greater than plate titre; " = ", slide titre equal to plate titre; " − ", slide titre one dilution less than plate titre.

heavier growth suspensions and a wide range of serotypes, and at the same time to perform tests in parallel with the usual porcelain plate method to enable a critical comparison to be made.

Materials and Methods.

The 15 leptospiral strains (representing nine distinct serotypes) and their homologous rabbit antisera used are shown in Table I. Human serum from natives of the Territory of Papua and New Guinea and sera from cattle suspected of infection with leptospirosis (collected from various districts in New South Wales) constituted the sources of material. The serum had been collected previously for other serological work (Forbes and Wannan, 1955; Keast, Wannan, Forbes and Lawrence, 1955). Preliminary trials with the use of leptospiral densities of the order of 50 to 100 million organisms per millilitre—usually obtained by five or six days' growth at 30° C. in a modified Schüffner medium (Davidson, Campbell, Rae and Smith, 1934)—were set up against their homologous rabbit antisera.

A drop scheme for dilution was made on white porcelain plates according to the following diagram (Figure I):

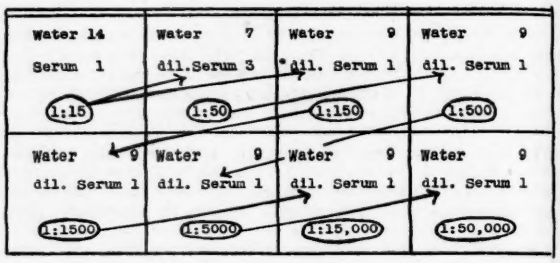

FIGURE I.
Drop scheme for serum dilution.

Thin "dark-ground" slides (one millimetre or less in thickness), divided by grease pencil into convenient squares, were prepared, and a platinum loop, made of 28 gauge wire and measuring approximately two millimetres in diameter, was used to transfer diluted serum and leptospiral suspension to the slide.

When one loopful of suspension was added and mixed with one loopful of each serum dilution, the dilutions then become approximately 1:30, 1:100, 1:300, 1:1000, 1:3000, 1:10,000, 1:30,000 and 1:100,000 respectively.

TABLE IV.

Analysis of Positive Slide Results Correlating Slide and Plate Methods.

Finding.	Serum Dilutions (330). 1:30.	1:100.	1:300.	1:1000 or Higher.
+[1]	46 (23·0%)	16 (18·4%)	4 (13·8%)	1 (7·7%)
=[1]	144 (72·0%)	71 (81·6%)	24 (82·7%)	12 (92·3%)
−[1]	11 (5·0%)	0	1 (3·5%)	0
Total	201	87	29	13

[1] " + ", slide titre one dilution greater than plate titre; " = ", slide titre equal to plate titre; " − ", slide titre one dilution less than plate titre.

Each slide so prepared was supported on a bent glass rod placed in a Petri dish, containing moistened filter paper to prevent drying, the lid was replaced, and the whole was maintained at room temperature.

Frequent observations over a thirty-minute period were made with dark-field illumination, an "8X" objective and "15X" eyepiece being used, and the whole volume of each dilution mixture being scanned.

TABLE V.

Classification of Leptospira Strains[1] (March, 1955) at the School of Public Health and Tropical Medicine.

Group.	Type.	Strain.	Laboratory Number.	Immune Sera.																										
				Wijn.[2]	04	15	16	25	13	31	36	37	12	11	638	29	28	39	40	30	32	34	38	35	14	33
Ia	*L. idero* AB.	Wijnberg, Jackson.	04	100	100	3	1	10	3	1	3	3	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Va	*L. canicola.*	Berlin. Hond.	15	1	3	100	100	—	1	1	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
			16	1	3	100	100	—	1	1	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
VIIIa	*L. pyrogenes.*	Salinetn.	25	1	10	3	1	100	33	100	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
	L. australis B.	Zamonl.	13	3	10	3	—	3	100	100	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
		" Robinson."	31	—	—	—	0·1	10	10	100	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
XIa	*L. autumnalis.*	Bangkinang.	36	3	0·1	—	—	—	—	—	100	100	3	—	—	—	—	—	—	—	—	—	—	—	—	—
XIc			37	3	1	—	—	—	—	—	100	100	3	—	—	1	1	—	—	—	—	—	—	—	—	—
XIIIa	*L. australis A.*	Ballico.	12	—	—	—	—	—	—	—	—	—	100	—	—	3	1	—	—	—	—	—	—	—	—	—
XIVa	*L. pomona.*	Pomona.	11	0·1	1	—	—	—	—	—	3	—	—	100	100	—	—	—	—	—	—	—	—	—	—	—
		" Longmore."	638	—	0·1	—	—	—	—	—	1–3	—	—	30–100	100	—	—	—	—	—	—	—	—	—	—	—
XVa	*L. grippotyphosa.*	Moscow V.	29	—	—	—	—	—	—	—	1	0·1	—	—	—	100	100	—	—	—	—	—	—	—	—	—
XVc		Bernkopf.	28	—	—	—	—	—	—	—	1	—	—	—	—	100	100	—	—	—	—	—	—	—	—	—
XVIa	*L. hebdomadis.*	dog HC.	39	—	—	—	0·1	—	0·1	—	—	—	—	—	—	—	—	100	3	100	30	100	—	—	—	—
XVIb	*L. medanensis.*	" Ives."	40	—	—	—	—	—	—	—	—	—	—	—	—	—	—	30	100	300	3	10	—	—	—	—
	L. medanensis.	" Szwajzak."	30	—	—	—	—	—	—	—	—	—	—	—	—	—	—	3	10	100	1	10	—	—	—	—
	?	" Kremastos."	32	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	3	3	33	—	—	—	—
	?		34	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	3	3	100	—	—	—	—
XVII	*L. bataviae.*	Se 62.	38	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	100	—	—	—
XIXa	*L. andaman A.*	CH-11.	35	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	100	—	—
XXa	*L. hyos (sutis J.).*	*Mitis* Johnson.	14	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	100	—
	?	" Celledoni."	33	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	100

[1] Expressed as a percentage of the titre of each strain with its homologous immune serum.
[2] The strain Jackson agglutinated Wijnberg serum to the titre stated by Dr. J. C. Broom.

Results.

In the preliminary tests with suspensions and their homologous antisera, as described by Kruger, the leptospires adhered in small groups within one minute, after five minutes unmistakable clumps appeared throughout the mixture, and within fifteen minutes large units of "spider-like" aggregations were seen to form. The last-mentioned did not appear to increase in size with further time and remained stable. The end-point titres determined at thirty minutes corresponded exactly with those obtained by the conventional plate method. With some leptospiral strains, a loose network of immobilized agglutinated organisms was first observed in the lower dilutions (1:30 to 1:300); these were gradually replaced at higher dilutions by the "spiders" till the end-point was reached, when many freely moving leptospires were evident.

With other strains, the loose network or "spider-web" type of agglutination persisted at all dilutions. This latter phenomenon was not common.

In Table II are set out the results of the 808 tests performed on both slide and plate. The difference between the two is seen to be some 6%. In no instance was there more than a single dilution difference in the results. Distribution among the various leptospiral serotypes is shown in Table III.

The 330 positive results from slide tests consisted of 201 (61·1%) at 1:30 dilution, 87 (26·3%) at 1:100 dilution, 29 (8·8%) at 1:300 dilution and 13 (3·8%) at 1:1000 or higher dilution. It will be seen from Table III that over all dilutions more positive results were obtained by the slide method than by the plate.

Table IV correlates agreement between slide and plate readings at various serum dilutions, and it will be noted that with increasing end-point titre there is increasing agreement between the two methods (72% to 92%).

Discussion.

The slide method described is an extremely simple and rapid one, requiring only small quantities of serum and suspension and allowing many tests to be performed with a moderate amount of material. One three-millilitre amount of a leptospire culture suffices for some hundreds of slide tests, and one drop of serum only is required for extensive tests against a wide range of leptospiral serotypes.

The relatively short incubation period (thirty minutes at room temperature) enables tests to be performed in a continuous manner; a routine screening procedure can be carried out by the use of a battery of some six specimens of serum, each diluted 1:15, with 16 suspensions each thirty minutes, followed by a period for microscopic reading.

This arrangement relieves the monotony and strain of long unbroken spells at the microscope.

Antisera of each serotype, diluted 1:20 and kept in a deep-freeze compartment, may be regularly used at the beginning of each week's tests for checking the weekly subcultures, and are readily available at short notice for the checking of specific agglutinability of a particular strain.

Provided that due care is taken to avoid contamination of the culture tubes, one tube of each leptospiral strain is adequate for the week's tests.

As was noted by Gardner, when agglutination due to a related serotype occurs, a changed pattern suggesting a partial sensitization of the organisms is seen.

The "spider-like" aggregations seen at a true end-point are not to be confused with *"Brutneste"*, *"agglutinats Stellaires"* or "Medusa heads" mentioned by Broom.

A little practice with suspensions and homologous antisera is necessary to make this distinction satisfactorily.

As a matter of interest, the strains now held at this School have been classified, according to the method recommended by Wolff, but by the use of the slide technique described here. This is presented in Table V and compares favourably with the classification of the same strains as determined by Wolff and others by the conventional plate method.

Conclusions and Summary.

1. The slide method here described provides a simple, rapid and economical method for performance of leptospiral screening tests. Satisfactory results were obtained over a wide range of leptospiral serotypes when in comparison with those obtained by the usual plate technique.

2. The method enables a quick check to be made for specific agglutinability of a strain.

3. Close agreement (72% to 92%) with the conventional plate method over the various dilutions of sera was obtained.

4. Classification of a series of leptospiral strains followed closely that of previous workers.

Acknowledgements.

I wish to thank the Director-General of Health, Commonwealth Department of Health, Canberra, for permission to publish this paper; Professor Edward Ford, Director of the School of Public Health and Tropical Medicine, for his interest in it; Dr. H. O. Lancaster for statistical advice; and Dr. B. R. V. Forbes for encouragement throughout and most helpful criticism.

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Reports of Cases.

RECURRENCE OF BENIGN TERTIAN MALARIA FOLLOWING INJECTION OF TUBERCULIN.

By E. A. NORTH, M.D., M.R.A.C.P.,

AND

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IN view of the rarity of malaria in private practice in southern Australia and of the nature of the probable cause of the relapse, the following case is recorded.

Clinical Record.

In November, 1949, a man, then aged fifty-three years, contracted benign tertian malaria in New Guinea. He was immediately treated with "Paludrine" and had one typical malarial paroxysm only. After the treatment of the primary attack, 0·1 gramme of "Paludrine" was given once a week for about four months. No relapse occurred during the next five years.

On December 1, 1954, a Mantoux test was carried out, with 125 tuberculin units of tuberculin P.P.D. A moderately severe local reaction followed. At forty-eight hours there was an area of infiltration 25 millimetres in diameter. There was, however, no vesiculation or necrosis.

Within a few hours of the injection of the tuberculin there were general symptoms consisting of a chilly feeling, malaise and headache. Fleeting pains occurred in the limbs. These symptoms continued over the next few days, and on December 5 the patient had a definite mild paroxysm with shivering and pyrexia followed by profuse sweating. Over the following week a definite tertian periodicity developed. On December 13, examination of a blood film showed increased reticulocytosis only. The next day—a few hours before a paroxysm was due—ring and amœboid forms of *Plasmodium vivax* were identified in a thick film preparation. A very mild paroxysm occurred that afternoon. Treatment with "Paludrine" was commenced the following day (December 15), and no further attacks have occurred.

Comment.

Two points call for comment. The first is the long period between the primary attack and relapse—namely, five years. Malaria naturally acquired in Victoria is virtually unknown. It can be stated confidently that there were no symptoms suggesting a relapse during this period of five years. Persistence of benign tertian malaria for more than four years must be considered a rarity (Morton, 1951).

The second point of interest is the precipitating cause of the relapse. According to Strong (1942), relapses may occur without obvious cause, but are apt to follow any condition which lowers the general resistance of the body. Amongst the many provocative measures used to induce a relapse for diagnostic purposes, Strong mentions the intravenous injection of typhoid vaccine.

The case reported above indicates that a reaction of the delayed or bacterial type of allergy may precipitate a relapse of benign tertian malaria. It seems likely that the injection of many other biological substances besides tuberculin and typhoid vaccine may also precipitate a relapse.

Acknowledgement.

Our thanks are due to Dr. Roderick Andrew for reading the draft of this report and for his helpful comments.

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CHROMOBLASTOMYCOSIS AT THE AGE OF ELEVEN YEARS.

By K. W. MEAD,
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A SCHOOLBOY, aged eleven years, gave a history of having had a red scaly lesion on his left knee for three years. He could not remember any preceding trauma to this site, but said that he often climbed fences on his way to school. For

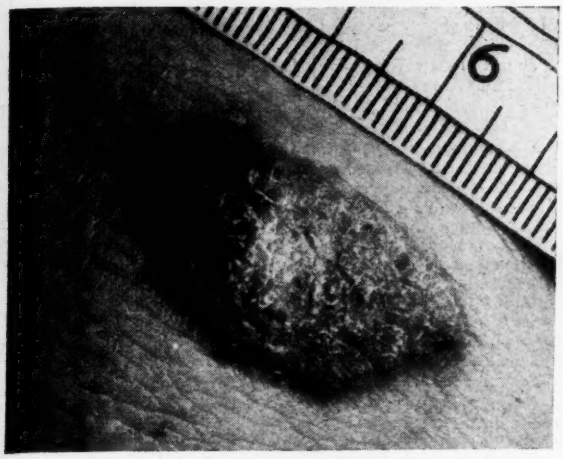

FIGURE I.
The lesion prior to treatment.

five years he had lived on a dairy farm, at Ceratodus, in the Upper Burnett Valley. No other members of the family had had chromoblastomycosis. The lesion was a solitary one, measuring 3·0 by 1·5 centimetres. The

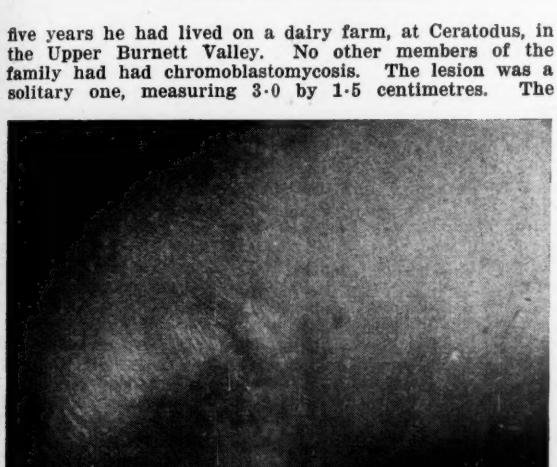

FIGURE II.
Two months after treatment.

diagnosis was confirmed histologically and X-ray treatment given with the following factors: H.V.L. one millimetre of aluminium, 80 kilovolts. The dosage was 2500*r* in five treatments of 500*r* each, over seven days. The photographs (Figures I and II) show the lesion before and after treatment.

This case is being reported because the disease apparently commenced at the early age of eight years.

Acknowledgement.

I wish to thank the Director of the Queensland Radium Institute for permission to report this case.

A FATAL CASE OF CHICKEN-POX.

By D. C. HENCHMAN,
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THE case to be described is of interest because of its rarity.

Clinical Record.

The patient, a boy, aged four years, first became ill on the night of October 23, 1954. The next day the vesicles of chicken-pox made their appearance. As she had nursed a patient with the illness before, the mother did not become alarmed until October 27, when the boy was drowsy all day and would not eat. She found that his temperature that afternoon was 104° F. At 7 p.m. he had a convulsive seizure, and was first examined by the writer fifteen minutes later.

The child was heavily marked by the typical lesions of varicella in their crusted stage. He was cyanosed, and there was much mucus in the pharynx. The pupils were equal and constricted, and both eyelids were twitching. His tongue was alternately protruding and retracting. There were clonic movements of the right arm and the right leg. The movements of the limbs, eyelids and tongue were synchronous, and at the rate of about two per second. The left arm and leg were held rigidly in a flexed position. An attempt was made to clear his airway, he was immediately given three grains of soluble phenobarbital by intramuscular injection, and he was conveyed to hospital forthwith.

Oxygen was administered and the pharynx was cleared by mechanical suction, and his colour improved. At this stage the rectal temperature was 105° F., the pulse rate was 150 per minute, and the respirations numbered 60 per minute. As the convulsions showed no sign of diminishing, he was given one one-hundred-and-fiftieth of a grain of atropine sulphate by hypodermic injection, and an "open" ether anæsthetic was commenced. Anæsthesia was deepened until the pupils were moderately dilated, by which time the twitching of the eyelids and tongue had ceased and the rigidity of the left arm and leg had relaxed, but clonic movements of the right forearm and right foot continued, although at a slower rate than before. The anæsthetic was then stopped.

An attempt was made to perform lumbar puncture, but this was unsuccessful because of spasm of the back muscles. At 9 p.m. he was much quieter, although there were still clonic movements of the right arm and right leg. He was given 400,000 units of "Penaquacaine Fortified" as a prophylactic against possible pulmonary complications, and sodium pentobarbital, 1·5 grains *per rectum*, for continued sedation.

Over the next half hour his respirations became progressively slower and shallower, his pulse became weaker, and his temperature rose to 107° F. The convulsions had ceased. Artificial respiration was applied by the Schäfer method, and an attempt was made to give an intravenous infusion of normal saline containing 250 milligrammes of "Terramycin" and two millilitres of nor-adrenaline to the litre.

He died at 10.15 p.m. Permission for an autopsy was not granted.

Discussion.

Garrod Batten and Thursfield's "Diseases of Children" quote Underwood as having recorded 120 cases of nervous complications of varicella, of which four were fatal.

Underwood states that varicella encephalitis "is essentially due to the development of neurotropism by the virus of varicella". The neurological complications consist chiefly of meningoencephalitis, encephalitis, myelitis and neuritis, the onset in most cases being between the fourth and tenth days after the appearance of the rash.

Despite the lack of confirmatory pathological evidence, it is submitted that the case described was one of varicella encephalitis.

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MYELOSIS AMONG NEW GUINEA NATIVES.

By JAN J. SAAVE, M.D.,

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THIS paper is intended to contribute details of two more cases of neoplastic disease of the hæmatopoietic system in primitive races.

Case I.

A male native of the New Britain District, aged approximately thirty-six years, was admitted to hospital on January 31, 1951. He had a history of progressive loss of weight for a period of approximately sixteen months, occasional vomiting, and considerable increase in the size of his abdomen.

On examination of the patient, auscultation and percussion of the chest revealed no abnormalities. The abdomen was distended. There was acute tenderness of the epigastrium. Palpation revealed an enlarged spleen, which occupied the greater part of the abdomen. The spleen was 250 millimetres (10 inches) in length (measured in the left mammillary line below the left costal margin) and 312 millimetres (12·5 inches) in width in the umbilical line. It formed a tumour of irregular outline with rounded edges and of hard consistency; it was very tender to touch. The liver was palpable just below the right costal margin. There was no costovertebral tenderness of the loins. The lymph nodes in both axillæ and groins were not enlarged. Œdema of both legs was present. Vision and hearing were not impaired. The upper and lower abdominal reflexes could not be elicited. His blood pressure was 105 millimetres of mercury, systolic, and 75 millimetres, diastolic.

A skiagram of the chest revealed slight enlargement of both hila, otherwise no abnormalities were detected. A blood examination on February 21 gave the following information: the hæmoglobin value was 40%; the erythrocytes numbered 3,020,000 per cubic millimetre, and the leucocytes 685,000 per cubic millimetre. The differential leucocyte count gave the following proportions: segmented neutrophile cells 39·15%, non-segmented neutrophile cells 14·84%, myeloblasts 42·30%, Rieder cells 0·33%, promyelocytes 0·66%, monocytes 0·30%, lymphocytes 2·26%, megakaryocytes 0·16%. Examination of the urine gave the following findings: the specific gravity was 1018, the urine was acid, albumin was present, the urine contained no sugar, and occasional granular casts were seen. Examination of the fæces revealed no occult blood, no hookworm ova and no evidence of *Entamœba histolytica*. The tentative diagnosis of myeloid leuchæmia was made, and the patient was treated with *Liquor Arsenicalis*, a protein-rich diet, procaine penicillin (course of 10 injections, 300,000 units per injection), and quinine, five grains daily, as a malaria suppressive.

The sudden enlargement of the spleen was considered to be due to an infarction. The temperature subsided shortly after institution of the treatment, and the patient's condition slowly improved. The spleen receded to almost half the original size. On June 15 its length was three and three-quarter inches below the costal margin and its width was seven and a half inches in the umbilical line. The patient gained in weight, and asked to be discharged from hospital. He went home on July 20. He reported for subsequent examination on February 19, 1952. His general condition was fair, and he did not complain of abdominal discomfort.

He was readmitted to hospital on October 23 in an advanced cachectic state, complaining of fever, distressing cough and abdominal pain. His weight was six stone five pounds.

On examination of the patient on October 23, auscultation revealed fine râles over both lungs, and prolonged expiration. Percussion revealed increased dullness over both lungs. The mucous membrane of the mouth was pale and cyanotic. The abdomen was distended and tender. The spleen was enlarged to four and three-quarter inches in length below the left costal margin and approximately seven and three-quarter inches in width in the umbilical line. Lymph nodes in both axillæ were distinctly enlarged. The intercostal spaces were tender to touch.

A skiagram of the chest showed soft, rounded opaque areas uniformly scattered throughout both lungs. There was no evidence of acid-fast bacilli in the sputum or in laryngeal swabs. A blood examination gave the following information: the hæmoglobin value was 40%, and the erythrocytes numbered 1,460,000 per cubic millimetre and the leucocytes 530,000 per cubic millimetre. The differential leucocyte count gave the following proportions: neutrophile cells 46%, eosinophile cells 2%, basophile cells 1%, monocytes 0·5%, lymphocytes 25%, myelocytes 48%. The blood urea content was 140 milligrammes per 100 cubic centimetres, and both the direct and indirect results of the Van den Bergh test were negative.

A skiagram of the chest on January 15, 1953, revealed occlusion of both phrenicostal sinuses and blurred outlines of the phrenimediastinal sinuses. Both lungs were studded with soft splotchy, partly confluent opaque areas of varying sizes. The general condition of the patient steadily deteriorated, and he died on February 23, 1953.

Autopsy Findings.

The post-mortem examination showed the cerebrum and cerebellum to be covered by apparently normal *dura mater*. However, multiple discrete, greyish nodules of firm consistency were present on the surface and base of the brain. It appeared that the leptomeninges were involved. Brain tissue was unusually soft and friable. In the skull no bony lesion was found. The right lung weighed 610 grammes and the left lung 560 grammes; both were considerably congested. The parenchyma was studded with multiple rounded growths of varying sizes from one to six millimetres in diameter. The hilar glands were considerably enlarged and of firm consistency. Dissection showed congested mucosa of the bronchial tree and excessive purulent contents. The heart was flabby and enlarged. In the pericardium fibrotic change was seen. Examination of sections revealed thin heart muscle of greyish colour and a solitary hæmorrhage into the myocardium of the left chamber 29 millimetres in diameter. The sternum was soft, and contained greyish-green diffluent, almost "purulent" bone marrow. The liver was considerably enlarged in size; it was 250 millimetres long, 110 millimetres thick and 750 millimetres wide, and weighed 2370 grammes. The organ was of extremely friable consistency and burgundy red in colour. The architecture was apparently lost. The spleen was enlarged and of firm, solid consistency; it weighed 945 grammes, and was 190 millimetres long, 125 millimetres wide and 70 millimetres thick. The capsule was thickened, and some grey nodules were seen at the hilum. The cut surface was greyish red and the trabeculæ were distinctly seen. The tail of the pancreas was adherent to the spleen and formed a solid mass with the surrounding enlarged glands. Examination of the stomach showed roughened mucosa and multiple petechial hæmorrhages. No gross lesions were found in the intestines. Peyer's patches in particular were not enlarged. The thoracic, paraaortic and mesenteric lymph nodes were moderately enlarged, and the cut surface was greyish-yellow. The kidneys were not enlarged. The

capsule stripped off easily. The cut surface was of dark red colour and the architecture was obscured. Multiple hæmorrhagic patches were distinctly seen. The penis was slightly enlarged; examination of sections revealed greyish-white nodules in the *corpora cavernosa*. In the skin multiple raised nodules and some maculæ were seen.

Histological examination of tissue from lungs and lymph nodes revealed an extensive caseating tuberculous process. Many acid-fast bacilli morphologically identical with *Mycobacterium tuberculosis* were identified in sections stained by the Ziehl-Neelsen method. Pulmonary alveoli not involved in the granuloma were filled with œdematous and cellular exudate. In sections of the base of the brain granulomatous foci were found; these were probably of tuberculous ætiology, although acid-fast bacilli could not be demonstrated. Liver cells in the central zone of lobules showed varying degrees of degeneration and sometimes vacuolation. There was considerable dilatation of sinuses, and the wide vascular channels contained large numbers of leucocytes. These cells were chiefly myelocytes and polymorphonuclear cells, together with occasional myeloblasts and normoblasts. An infiltrate of similar type was observed in the portal tracts. The pulp spaces and venous sinuses of the spleen were enlarged and lined by swollen endothelium. Large numbers of cells including myelocytes, polymorphonuclear cells and nucleated red cells were observed in these sites. In sections of the sternum very active marrow was found, with a distinct "shift to the left" of myeloid cells.

Comment.

The findings indicated chronic myelogenous leuchæmia complicated by caseating tuberculosis. It is considered that in view of the histological appearances in the liver, spleen and bone marrow the peripheral blood picture could not be regarded as a leuchæmoid response to tuberculous infection.

Case II.

A male child, of Rabaul Subdistrict, aged approximately ten years, was admitted to the hospital on February 11, 1952. He had had a sore throat and earache for about two weeks prior to his admission. Suddenly he developed fever with rigor and excruciating pain in the limbs.

On examination, the patient was very apathetic and irritable. The mucous membrane of the mouth was pale and showed splotchy hæmorrhagic patches. The tonsils were enlarged, highly inflamed and covered with yellow-green spots. The mucous membrane of the nose was diffusely indurated and showed early ulceration. The ear drums on both sides were injected. The epitympanum and mesotympanum were bulging and were of a glossy red appearance. Rhonchi and increased tubular breathing were present over both lungs. Percussion revealed generally increased dullness. There was a distinct systolic murmur over the heart. The abdomen was soft. The spleen and liver were moderately enlarged. The sternum and long bones were very tender on percussion. The skin appeared normal. A blood examination on February 12, 1952, gave the following information: the hæmoglobin value was 16%; the erythrocytes numbered 980,000 per cubic millimetre and the leucocytes 23,800 per cubic millimetre; a differential leucocyte count showed that 61% were myeloblasts, 4·3% metamyelocytes, 0·3% normoblasts and 34·4% lymphocytes.

A diagnosis of acute myeloid leuchæmia of fulminating type was made. The clinical course was very stormy, and the patient died on February 17. Autopsy was refused.

Comment.

An analysis of 500 cases by Hoffman and Craver (1931) showed that the disease was present approximately one to two years before it was recognized. The first patient reported to the hospital with an enlarged spleen and abdominal discomfort for the first time late in 1949. He was treated for malaria and was discharged. He was readmitted on January 31, 1951, and chronic myeloid leuchæmia was diagnosed. There was no clinical or radiological evidence of pulmonary tuberculosis. However, on his third admission to hospital on October 23, 1952, a skiagram revealed distinct pulmonary lesions. After consultation with a chest physician, this diffuse miliary infiltration of both lungs was considered to be a coexisting pulmonary tuberculosis. The invasion occurred most probably by the hæmatogenous route and was a complication of rather unusual intensity. No neurological lesions were seen. In the late stage of the disease the patient developed distressing priapism, accompanied by intense pain, and there was no response to any treatment. Necropsy revealed leuchæmic involvement of the *corpora cavernosa*. The changes in the male reproductive system are described by Piney and Riach (1932). Thrombosis is considered to be the cause of this symptom. The leuchæmic metastases involved liver, spleen, *corpora cavernosa* and sternum. The coexisting tuberculous process involved brain, lungs and lymph nodes.

The importance of initial lesions in the ear, nose or throat as manifestations of acute myeloid leuchæmia are stressed by Love (1936). The second patient had distinct involvement of both eardrums, nose and mouth.

Three cases of myeloid leuchæmia were encountered in the period from May 1, 1950, to May 1, 1953; they constitute 0·01% of all admissions to the hospital.

Summary.

One case of chronic myeloid leuchæmia complicated by generalized caseating tuberculosis in an adult native and one case of acute myeloid leuchæmia in a native child are presented with their clinical, pathological and histological findings. The condition seems to be less frequent in New Guinea natives than in western races.

Acknowledgements.

I should like to thank Dr. J. T. Gunther, Director of the Department of Health, Territory of Papua and New Guinea, for his permission to publish this paper, Dr. B. R. V. Forbes, School of Public Health and Tropical Medicine, University of Sydney, for his histological report, and Mr. E. Burt, pathology technician, Rabaul, for his help.

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Reviews.

Applied X-Rays. By George L. Clark, Ph.D., D.Sc.; Fourth Edition; 1955. New York: McGraw-Hill Book Company, Incorporated. 9" × 6½", pp. 852, with 415 illustrations. Price: $12.50.

THE applications of X rays extend widely outside the medical field. They include industrial radiography, the microradiography of alloys, the production of chemical and biological effects, and the analysis of the structure of materials and even of atoms. In the fourth edition of his book, George L. Clark has extended earlier editions to cover more recent developments in the broad field of the applications of X rays.

The preface to the first edition stated that the aim of the author was to produce not a handbook for experts, but an understandable survey of X-ray science as it was then known. The first edition of 251 pages published in 1927 achieved this object with such success that further editions in 1932 (470 pages) and in 1940 (674 pages) have now been followed by a volume of 843 pages of slightly smaller print. The author has realized that, even with this expansion in size, it has been impossible to deal in any great detail with many of the modern advances which have occurred. Because of this limitation, important developments in the super-voltage equipment such as the linear accelerator are compressed to a page.

New material includes a chapter on microradiography, and extensions to the chapters on chemical and biological effects. The greater portion of the book (540 pages) devoted

to the author's special interest (the analysis of crystal structure) comprises much new material. This includes the results of many recent investigations, particularly into the structure of metals and the wide range of important materials popularly known as plastics.

The author, who has a distinguished record of thirty-five years of teaching and research in problems involving the use of X rays, is obviously deeply interested in his subject. The volume in consequence shows evidence of careful preparation and a judicious selection of material. It is profusely illustrated with over 400 figures, and excellently printed.

The book can be thoroughly recommended to those who wish to become informed on the general aspects of the applications of X rays, as well as to all those beginning the study of the increasingly important subject of the structure of materials.

Human Physiology. By Bernardo A. Houssay, M.D., Juan T. Lewis, M.D., Oscar Orias, M.D., Eduardo Braun-Menéndez, M.D., Enrique Hug, M.D., Virgilio G. Foglia, M.D., and Luis F. Leloir, M.D., with a foreword by Herbert M. Evans, M.D.; Second Edition; 1955. New York: McGraw-Hill Book Company, Incorporated. 10″ × 7½″, pp. 1194, with 504 illustrations. Price: $12.00.

THE second edition of this book is, in format, of the same high standard as the first. It does not, however, contain the usual preface stating in what ways it differs from the first edition. Comparison of chapter headings shows only a few minor rearrangements, mostly in the section on digestion. There has been an increase in length of fifty-three pages, fairly evenly spread throughout the book.

On looking into details, there is evidence of editorial alertness. This edition refers to Eccles's work on synaptic potentials and Adrian's on the sense of smell. Aldosterone is mentioned and the Holger-Nielsen method of artificial respiration has replaced that of Schäfer. On the other hand, the confusing statements on the tonus of the heart (page 93) and the effect of oxygenation of hæmoglobin on carbon dioxide transport (page 275), noted by our reveiwer of the first edition, are unchanged. A rather important failure to move with the times occurs in the consideration of factors affecting cardiac output. There is almost no reference to the effects of changes in force of contraction of the heart induced by autonomic influences or adrenaline. This is now considered by many workers to be at least of equal importance with diastolic filling in determining the stroke volume of the heart. One of the lesser points noted was that the treatment of the Bainbridge reflex is still traditional rather than critical. Also the actions and roles in the body of adrenaline and nor-adrenaline could, with advantage, be more clearly distinguished.

Points for criticism, such as the above, can, of course, easily be found in many large text-books. They are emphasized here to account for a feeling of disappointment that the great effort which must have gone into producing two editions of a totally new text-book of this size within five years has resulted in an adequate text-book of physiology and not in an outstanding one.

Practical Obstetric Problems. By Ian Donald, M.B.E., M.D. (London), B.A. (Cape Town), M.R.C.S. (England), L.R.C.P. (London), M.R.C.O.G.; 1955. London: Lloyd-Luke (Medical Books), Limited. 8½″ × 6″, pp. 590, with 29 illustrations. Price: 45s.

THIS book can be recommended to all who practise obstetrics. It is a masterly presentation of the difficulties which arise in association with pregnancy and parturition and of the methods used by the author to combat them. For the worried practitioner it will provide a means of reference much more convenient than the usual cumbersome text-book which contains so much that is irrelevant to him who seeks merely a clear-cut solution to a problem. In a work of such consistently high quality praise of individual articles might be redundant, but there can be few obstetricians who would not profit from that on *diabetes mellitus*, in which hormone imbalance is intimately discussed with reference to the work of well-known research workers. The toxæmias of pregnancy are well dealt with by Harvey Carey, breech and other abnormal presentations by Gordon Garland, and relief of pain by Hilda Roberts. The discussion on ante-partum hæmorrhage is lengthy but sound, and the advice given is in accordance with generally accepted principles. In contradistinction to modern tendencies, the author's plea for conservatism is firm, whether it is in relation to pregnancy and tuberculosis, the cardiac patient or ante-partum hæmorrhage. Indeed, undue readiness to terminate a pregnancy or to replace natural delivery by Cæsarean section is at all times condemned. Disproportion is a difficult problem, but one cannot agree that trial of labour begins only when the membranes rupture. Theoretically it is so, but translation of this dogma into practice might sometimes mean "trial by ordeal". This is surely ultra-conservatism. It is surprising to find a long article on the use and misuse of antibiotics in a work of this nature; however, its relevance cannot be denied and it is worthy of ingestion and assimilation by all, whatever the branch of medicine they pursue. Knowledge, wisdom and humility are the beneficent fruits to be plucked from this delightful work.

Books Received.

[The mention of a book in this column does not imply that no review will appear in a subsequent issue.]

"The Year Book of Neurology, Psychiatry and Neurosurgery (1954-1955 Year Book Series)"; Neurology, edited by Roland P. Mackay, M.D., Psychiatry, edited by S. Bernard Wortis, M.D., Neurosurgery, edited by Percival Bailey, M.D., and Oscar Sugar, M.D.; 1955. Chicago: The Year Book Publishers, Incorporated. 7¾″ × 5¼″, pp. 620, with 97 illustrations. Price: $7.00.

One of the Practical Medicine Series of Year Books.

"The Medical Clinics of North America"; 1955. Philadelphia and London: W. B. Saunders Company. Melbourne: W. Ramsay (Surgical), Limited. Nationwide Number. 9″ × 6″, pp. 306, with 123 illustrations. Price: £7 5s. per year in cloth binding and £6 per year in paper binding.

A symposium of 19 articles on arthritis and rheumatic diseases by clinical investigators specially qualified to deal with their respective subjects.

"Illustrated Practical Nursing Procedures for Hospital Assistants", by Josephine Scott, S.R.N., S.C.M., S.R.M.N.; 1955. London: William Heinemann (Medical Books), Limited. 8½″ × 5½″, pp. 128, with 64 illustrations. Price: 15s.

Compiled originally for hospital assistants in dispensaries and out-stations to refresh their memories on what they were taught at the African Medical Training School.

"The Year Book of Orthopedics and Traumatic Surgery (1954-1955 Year Book Series)", edited by Edward L. Compere, M.D., F.A.C.S., F.I.C.S.; 1955. Chicago: The Year Book Publishers, Incorporated. 7¾″ × 5¼″, pp. 384, with 193 illustrations. Price: $6.00.

One of the Practical Medicine Series of Year Books.

"Midwifery", by Ten Teachers, under the direction of Frederick W. Roques, M.D., M.Chir., F.R.C.S., F.R.C.O.G., edited by Frederick W. Roques, John Beattie and Joseph Wrigley; Ninth Edition; 1955. London: Edward Arnold (Publishers), Limited. 8½″ × 5½″, pp. 616, with 249 illustrations. Price: 32s. 6d.

A new edition of a well-established text-book. For the first time one of the contributors is a pædiatrician.

"Garrison and Morton's Medical Bibliography: An Annotated Check-List of Texts Illustrating the History of Medicine", by Leslie T. Morton; Second Edition; 1954. London: Grafton and Company. 8½″ × 5½″, pp. 670. Price: £5 5s.

The number of items totals 6808.

"Virus and Rickettsial Diseases", by S. P. Bedson, M.D., D.Sc., F.R.C.P., F.R.S., A. W. Downie, D.Sc., M.D., F. O. MacCallum, B.Sc., M.D., and C. H. Stuart-Harris, M.D., F.R.C.P.; Second Edition; 1955. London: Edward Arnold (Publishers), Limited. 8½″ × 5½″, pp. 416, with 33 illustrations. Price: 30s.

Extensively revised and in places rewritten.

"Approach to Clinical Medicine", by R. H. Micks, M.D. (Dublin), F.R.C.P.I.; 1955. London: J. and A. Churchill, Limited. 7½″ × 5″, pp. 144. Price: 8s. 6d.

A short book for students beginning their clinical work.

The Medical Journal of Australia

SATURDAY, JULY 30, 1955.

All articles submitted for publication in this journal should be typed with double or treble spacing. Carbon copies should not be sent. Authors are requested to avoid the use of abbreviations and not to underline either words or phrases.

References to articles and books should be carefully checked. In a reference the following information should be given: surname of author, initials of author, year, full title of article, name of journal, volume, number of first page of the article. The abbreviations used for the titles of journals are those adopted by the Quarterly Cumulative Index Medicus. If a reference is made to an abstract of a paper, the name of the original journal, together with that of the journal in which the abstract has appeared, should be given with full date in each instance.

Authors who are not accustomed to preparing drawings or photographic prints for reproduction are invited to seek the advice of the Editor.

THE HONOUR AND INTERESTS OF THE MEDICAL PROFESSION.

THE British Medical Association has two objectives—the promotion of the medical and allied sciences and the maintenance of the honour and interests of the medical profession. Its members know this, though some of them might find it difficult to put their ideas into words. Stress has always been laid on the order in which the objectives are stated. The medical and allied sciences must come first, and all that pertains to the practitioners of those sciences must be relegated to second place. This is as it should be, for after all the more complete the knowledge of medicine and of all that pertains to it is, the more effective will its practitioners be. Some of its members may look on the Association as a large impersonal affair—the Association does this or that, it is responsible for this or for that. In some respects this is true, because the Association acts from time to time as a corporate body. In such actions the Association's decisions on matters of policy are binding on its members, for they have been formulated by elected representatives of members. If we look at it in another, and undoubtedly the correct, way it is not the impersonal Association which makes decisions and acts on them; these things are done by individual members, and every member has a share in what is done. This needs emphasis.

During recent weeks the extent of the Association's scientific activities and the strength of its appeal have been demonstrated at Toronto in Canada, where the Association has held its annual meeting in conjunction with that of the affiliated Canadian Medical Association. Dr. T. C. Routley's address as President and the reports of sectional meetings published in the *British Medical Journal* are evidence of strong vitality and of the desire to "promote" the medical and allied sciences. A similar demonstration will be made at Sydney on August 20 to 27 at the Ninth Session of the Australasian Medical Congress (British Medical Association) under the presidency of Sir Charles Blackburn. With all this evidence of attention to the scientific side, we do well to turn to the "maintenance of the honour and interests" of the profession. This means much more than preservation of the financial status, the financial interests, of the doctor, and the spreading among all and sundry of the injunction commonly heard at church services arranged for the medical profession: "Honour the physician . . . with the honours due unto him." If we say that a person is held in honour we mean that he is treated with respect and with deference and with something more, something that may be admiration or even affection. This respect and deference and this something more are earned by him, by his integrity, by the way in which he treats other people, by his lack of self-seeking—in other words by his character. Honour paid to a man has been described as outward and inward. Outward honour may be paid to a man because of the office he holds. A king naturally receives outward honour because he is a king; he receives inward honour because he is a good king, because he recognizes his tremendous obligations and meets them. Medical practitioners in some communities achieve a certain amount of outward honour because they are members of what is supposed to be an honourable profession; any inward honour paid to them comes in virtue of what kind of men they are and how they live, in other words how they fulfil their obligations. The more prominent a medical man becomes in his professional ranks or in community life, the more do his obligations increase. It has been said with much truth that honour and ease are not often bedfellows. This brings us to the interests of the profession which are to be "maintained". The interests of the profession will generally be taken to refer to methods of practice, the opportunities available for post-graduate study, the freedom of the practitioner, especially the avoidance of bureaucratic control, and the monetary return that a practitioner may expect to receive. The practitioner's chief interest, his main concern, should be, and we believe generally is, the welfare of his patient. It might appear that some of these interests are in conflict with one another, but this conclusion would seldom be correct. The welfare of the patient is best served if the practitioner is free to put into practice in any manner that he may choose what he has promised in his Hippocratic Oath. This is true also in regard to post-graduate study. We all know that the British Medical Association in Australia through its Federal Council has done a great deal to maintain the honour and interests of the medical profession. This is corporate action by the profession carried out for its individual members. (Incidentally we would observe that its labours have been of immense benefit to the whole community.) Whether the result will be what is desired will depend on the response of individual members of the Association. The failure of certain groups of members to follow the advice of the Federal Council in the matter of the non-raising of fees in private practice has been most regrettable and has not tended to bring honour to the profession. (This was

advice and not a matter of policy, for the Association's policy is not to dictate to its members about fees charged.) It would be possible to advance reasons for the raising of fees, but that is not the point; the point is that advice from the authoritative body of the profession has not been followed. A discussion on the honour of the profession will not be complete without reference to the abuse of the Pensioner Medical Service. Not long ago a practitioner who was looking for a partner to replace a senior who was retiring said that he could find no one who wished to be a doctor—all whom he interviewed were concerned only with the money side of the venture, they wanted to be business men. To be primarily a business man instead of a healer of the sick is reprehensible, but that is nothing in comparison with the sins that are committed under the cloak of the Pensioner Medical Service. It is to be hoped that at the meeting of the Federal Council to be held at Sydney on August 17 next some methods will be devised for the checking of abuses. In any steps that may be taken to check abuses the Federal Council will be carrying out its duty to the Association.

Current Comment.

CONGENITAL DEFECTS.

As more and more evidence accumulates it becomes obvious that the mechanisms by which congenital defects arise are exceedingly complicated. Once it used to be assumed that interruption, retardation or arrest of embryonic development, due probably to the non-specific effects of some illness in the mother at some critical stage of her pregnancy, accounted for all defects. This theory was not at all affected by the discovery that it was possible, by microdissection of chromosomes, to produce any desired defect in fruit-flies—this was not a process that could occur naturally. That from time to time natural mutants could appear without obvious cause had apparently nothing to do with the matter, and that mutation in fruit-flies could be produced by irradiation, or in plants through the influence of colchicine, seemed to be equally irrelevant. Comparatively recently, however, it has become obvious that these apparently unrelated observations, together with others of a similar nature, can be coordinated, and some interesting theories are emerging.

To begin with, irradiation of the gonadal germ cells in sub-destructive doses produces two effects. Small doses can cause chance mutations in the genes, and some geneticists consider that retrograde mutations could at times be responsible for hereditary fœtal defects of the same type as true congenital ones. Polydactylism is possibly an example of this type of defect. Larger doses of irradiation can cause direct damage to chromosomes leading to maldevelopment of the fœtus; this is purely mechanical, analogous to the damage done by microdissection of fruit-fly chromosomes. Then there are the simple accidents, of which the type of *talipes varus* which is obviously due to the foot's having become entrapped in the bend of the opposite thigh, is a good example.

These are what might be classed as purely mechanical defects. Now P. K. Duraiswami[1] has carried out a series of experiments on developing chickens which, because they are rigidly specific in their results, put the matter in an entirely new light. Various substances were injected into the yolk-sacs of eggs ninety-six hours after the start of incubation. Insulin caused the development of angulation of the tibiæ and defects in the beak; "Soluseptasine", thallium nitrate and benzyl-alcohol caused similar defects. It is interesting, and perhaps significant, that the bone defects correspond in most particulars with the condition of congenital kyphoscoliotic tibia in man, which is of unknown ætiology. When lead nitrate was injected, meningocele, cranioschisis, hydrocephalus and paralytic deformities of the limbs resulted; 3-acetylpyridine caused myodystrophy, and cortone acetate caused inhibition of general growth, *ectopia viscerum*, defects in the amnion, general œdema and absence of feather formation. When two substances were injected together, the defects characteristic of each appeared together in the embryos. Here there is an apparent anomaly—while some drugs are quite specific, another type of defect is constantly produced by a group of totally unrelated substances—yet it is not logical to regard the action of insulin, "Soluseptasine", thallium nitrate and benzyl-alcohol as non-specific, especially as the effect of both insulin and "Soluseptasine" can be inhibited by the presence of nicotinamide, while that of the others can not; moreover, insulin produces hypoglycæmia in the embryo, but "Soluseptasine" does not. It is more likely that each of these substances, although acting in a different way or at a different point, achieves the same end result. Growth and differentiation during embryonic development depend upon a harmonious integration of a great variety of well-regulated metabolic processes, each in turn depending on its own appropriate hormone-enzyme complex. It is generally agreed that the action of the genes is effected through the production of catalysts or inhibitors which regulate the action of the hormone-enzyme complexes. It is not difficult to conceive that various chemical substances may have the same catalytic or inhibitory effects as are produced by the genes, and it is but a step further to conceive that the effect of certain substances in the mother's circulation could affect the development of the embryo, just as do certain substances when they are injected directly into the yolk-sac. This is a most desirable and acceptable theory, because it coordinates the hereditary action of genes and the environmental action of terastogenic substances or processes into one line. It is supported by further evidence. Hydrocephalus and *spina bifida* have been produced in the offspring of pregnant rats injected with trypan blue, and cleft palate has similarly been produced with insulin. These effects are completely specific. Equally specific are the defects which occur in the children of women who suffer from rubella at the critical period. That all these phenomena could be non-specific, or could be due to directly toxic effects on the embryo, is untenable.

Another aspect of the same problem is discussed by Duraiswami. It has been reported that from 185 uteri which had been surgically removed for various reasons 36 embryos under seventeen days old were recovered, and thirteen of these were abnormal. Other reports show that almost half of the embryos examined as a result of recognizable abortions are malformed. These and similar figures suggest not only that many abortions and miscarriages are primarily due to malformations incompatible with viability of the fœtus, but also that many unsuspected pregnancies in the early stages terminate because of similar malformations of the fœtus. If all embryos and fœtuses, from every possible source, could be examined carefully, and any defects correlated with teratogenic possibilities in the mother's recent history, much valuable information on the whole subject could be obtained. There is no doubt that work on these lines would be most rewarding.

[1] *J. Bone & Joint Surg.*, April, 1955.

THE TREPONEMA PALLIDUM IMMOBILIZATION TEST.

IN 1948, although he did not succeed in cultivating *Treponema pallidum*, Nelson did succeed in devising a medium in which the organism could be sustained with normal virulence and motility for at least a day or two. Then in 1949 Nelson and Mayer described the phenomenon of immobilization of *T. pallidum* in the presence of syphilitic serum, from which in 1951 Nelson and Diesendruck derived the Treponema Pallidum Immuniza-

tion Test (T.P.I.). Now Herbert B. Smith[1] has published a survey of results of two years' use of the test. Since it is intricate and time-consuming, and is unreliable early in an infection (because immobilizing antibodies take an indefinite time to form) or after treatment (because a variable amount of treatment brings about the disappearance of immobilizing antibodies), it must be reserved for problem cases. It is invaluable in the diagnosis of latent syphilis, and in late ante-natal cases when the standard serological findings are doubtful or conflicting and time is important, and it is the only test which can determine instances of biological false-positive reaction.

Smith's technique involves injecting large numbers of organisms into the testes of a rabbit and removing the testes when orchitis develops. They can be used at once, or may be stored at −70° C. Serum for testing is inactivated and then stored at −20° C. When needed, sliced testis is placed in one of the suitable media in a flask under 95% nitrogen and 5% carbon dioxide, and gently shaken in a waterbath at 35° C., to extract the organisms from the tissue. Periodic examinations of the supernatant fluid are made, and when a concentration of six to ten organisms per high-power dry field (the optimum level) is reached, the supernatant fluid is centrifugalized with various controls, including one to check for antibiotics in the serum (streptomycin and PAS treatment, for instance, renders the serum extremely toxic to treponemas, though the drugs *in vitro* have no effect); the suspension of organisms and the serum are incubated in Brewer jars for sixteen hours; then, under dark-field microscopy, the percentage of organisms which remain motile is calculated. The exclusion of oxygen except during the actual examination of the preparations is essential, as it kills the organisms. All unsatisfactory tests are repeated with added penicillinase—the high percentage which cleared after this is some indication of the widespread unofficial use of penicillin.

The test has come to be regarded as the final authority when, for example, the Kahn and Wassermann tests give conflicting, inconclusive or weak results, when clinical signs of syphilis are associated with negative results of the standard serological tests, or when the standard tests give positive results in the absence of any clinical indications of syphilis. In this last category must be many unfortunate people who will ultimately prove to be biological false-positive reactors, but who, caught up in the all-encompassing, drag-net routine of production-line "clinics", have been unnecessarily tested, incorrectly labelled, and unavailingly treated. It is the "routine" Wassermann test, so widely used in clinics of this type, in the pre-marital examinations generally carried out in the United States of America, and in the all-too-frequent instances when it is ordered in laziness or ignorance in the hope that it may turn up with a positive result to explain some out-of-the-way symptom, that uncovers most of the false reactors. At any rate, the T.P.I. test is not likely to be performed as a routine—it is far too cumbersome and expensive. In Canada, Smith's department limits its use; serum from known treated syphilitic patients is not accepted, nor is serum accepted from untreated patients until they have undergone the standard tests, without conclusive results, on two previous occasions. Despite its limitations, however, Smith's figures demonstrate the value of the test, and it is to be hoped that its use will be extended.

SICKNESS ABSENTEEISM.

THE New York Telephone Company employs 50,000 women and 25,000 men, and on any working day 2300 women and 700 men are absent from work because of sickness. The medical officer of the company, N. Plummer, with L. E. Hinkle,[2] has analysed sickness absenteeism. These authors show that there has been an overall increase during the last thirty years, despite the fact that the general health of the population has improved remarkably, while the course of many diseases has been shortened and others have been rendered much less disabling. The major curves in the graph for those thirty years show that during the depression of the early thirties absenteeism was lowest, during the war years when there was full employment it was highest, during the post-war years with their high wages and full employment it was high, and it is now declining slightly as business activity is tightening up. What may be called the primary trend, then, is that with work readily available, wages high, and jobs easy to get, absenteeism is high. But the anomalous general rise in the curve must be explained by other factors. Plummer and Hinkle state that although sickness times are in general shorter, doctors nowadays are cautious about the duration of convalescence and tend to approve longer periods off work, while with higher wages and more generous sickness and insurance benefits employees are better able to afford a stay away from work. Another aspect of this secondary trend is shown by the figures for the two sexes: the graphs are parallel, but women have about twice the absenteeism of men, which is explained by the fact that most of the men are breadwinners while most of the women are not, so that in general women can better afford to lose a few days' wages than men can.

The next part of the analysis is the important part. Considered individually, employees do not share equally in absenteeism. Ten *per centum* of individuals have no absences, while at the other end of the scale 10% of individuals account for 45% of the total absenteeism. The same individuals appear in the same groups at the same levels every year. This gives rise to the conclusion that there are "absence-prone" people, just as there are accident-prone people. The analysis is then carried through to include personal details. It was found that the high-absence group suffered three times as many accidents (and these more severe) than the low-absence group, ten times as many operations (and these bigger), twelve times as many respiratory infections, and 95 times as many gynæcological disorders. In this investigation of absenteeism, which adds so greatly to industry's labour costs, it is inevitable that the approach should have an economic bias, and so it is not surprising that these authors adopt a psychosomatic attitude towards their findings. They emphasize that the high-absence group suffered 21 times the number of psychological upsets, and that the low-absence group was composed of happy and contented persons living a simple and orderly life; they were cooperative, interested in their work, and well liked, while the high-absentees were discontented and resentful, frustrated and unhappy at work and in their homes, with few friends; they eagerly seized any minor excuse to miss a few days' work.

But in fact, the group labelled "absence-prone" contains the accident-prone (who are less active, more awkward, more careless, slower thinking and slower reacting than their fellows), the sickness-prone (who have poorer constitutions) and those who are inherently less stable psychologically than their fellows. Now, since good health is the first requisite for happiness and contentment, and bad health tends to make people frustrated and resentful, it hardly seems fair to link up the latter qualities directly with absenteeism, ignoring the intermediate factors. Surely it is more reasonable to regard the less pleasing aspects of the absence-prone group's character as an effect, equally with absenteeism, of their inherent physical and mental shortcomings, rather than as the cause of both the shortcomings and the absenteeism.

Plummer and Hinkle recommend concentrating on the 10% of absence-prone employees who are responsible for 45% of the absenteeism, making an intensive medical study of them, and managing them resolutely but kindly. In the worst cases they recommend, in effect, discharging them with some small compensation. One thing they do not consider is the matter of suitability of employment. It is true that people cannot produce good work unless they are interested in it, and unless it suits their mental and physical capacity; yet many take the first job offering and continue in it regardless of its suitability, producing results that are barely good enough to satisfy their

[1] *Canad. M. A. J.*, April, 1955.
[2] *Arch. Indust. Health*, March, 1955.

employers, at a considerable cost to themselves in physical and mental wear and tear. Cooperation between medical and personnel officers can result in reallocation of many of these people with excellent results. Just how any other type of management is likely to alter the situation to any great extent is not very clear. Just as there is a group of 10% of employees who are really unsatisfactory, so there is a group of 10% who are highly satisfactory, and there are all grades between. This is merely according to the normal range of human endeavour and ability, and industry has no choice but to accept the bad with the good. A small firm may pick and choose, but a large organization cannot select all its employees from the more efficient groups—it must be content with a good average performance from its employees as an average group.

ELECTIVE CARDIAC ARREST.

THE cardiac surgeon's ideal requirements include working on a quiescent empty heart. So far this requisite has not been realized, but D. G. Melrose, B. Dreyer, H. H. Bentall and J. B. E. Baker[1] have induced cardiac arrest for over fifteen minutes experimentally in animals, and they suggest that their technique might usefully be extended to human beings. With the vessels clamped, the heart, if it continues to beat, is not only difficult to handle, but it rapidly becomes asphyxiated; moreover, air which enters the cavities and becomes trapped there causes massive embolism when the circulation is recommenced. So important can this last trouble become that some workers have gone to the length of inducing ventricular fibrillation in order to prevent trapping and ejection of air, while others have devised a dam or well, filled with saline solution, to exclude air completely from the field of operation. But Melrose and his colleagues have devised a much simpler and more satisfactory method. Starting with Hooker's suggestion that an excess of potassium chloride might be used to stop a fibrillating heart, which Montgomery *et alii* adapted to deal with fibrillation complicating operations under hypothermia, they tried various modifications of these ideas. Finally, in anæsthetized dogs, whose vital centres were protected either by perfusion with a heart-lung machine or by hypothermia, and whose hearts were isolated by clamping the large vessels, they placed a catheter into the stump of the ascending aorta, proximal to the clamp, and injected through it a 2·5% solution of potassium citrate. As soon as this solution enters the coronary arteries, within about five seconds the heart is arrested in diastole. It is completely flaccid, so that residual air can easily be squeezed out when the operation is over. After fifteen minutes without coronary blood flow the heart remains pink, and serial determinations on blood from the coronary sinus show that only a negligible amount of oxygen is being consumed. No stimulants are needed to start the heart's beating again—perfusion of the coronary vessels with oxygenated blood is all that is necessary. When the heart-lung machine is being used, releasing the aortic clamp achieves this; when the dog is under hypothermia, the catheter in the aorta may be connected to a bottle of blood under pressure, without releasing the clamps—a single electric shock is then required, to start normal rhythm. Undoubtedly this work lays the foundation for some valuable contributions to heart surgery, and it is to be hoped that it will be followed up in the near future.

TWO NEW USES FOR RADIOACTIVE ISOTOPES.

AMONG the new uses suggested for radioactive isotopes, there are two which merit some mention. At the time of operation for fracture of the femoral neck, the surgeon has no criteria by which to determine whether avascular necrosis of the detached head is likely to develop. H. B. Boyd, D. B. Zilversmit and R. A. Calandruccio[2] have conducted some experiments aimed at providing the surgeon with data to enable him to decide on the best operative course to adopt. Radioactive phosphorus (P^{32}) has a short half-life, emits only pure β rays, and seeks out bone to a moderate degree; if avascular necrosis is the result of diminished blood supply to the detached femoral head, then the amount of P^{32} taken up by the head, as compared with that taken up by the trochanteric area, will give an index of the diminution in blood supplied to the head, and so of the likelihood of the development of avascular necrosis; deposition of P^{32} in the bone can be measured by a special Geiger-Müller β ray counter, with a probe extension which bears the sensitive receptor. To apply these principles, two microcuries of P^{32} per pound of body weight are injected intravenously; one and a half hours later, the counter probe is inserted into holes drilled through the trochanter and the head of the femur, and counts are made at both sites. The hole in the head should enable the probe to reach the weight-bearing upper portion, where the most useful counts can be obtained. The ratio of trochanter-count to head-count is worked out. From the experiments so far carried out, the authors suggest that when the ratios are from 1·3 to 2·3, the prognosis is probably good; from 4·1 upwards, probably bad; and for the intervening zone, unpredictable. There is every likelihood that further observations will enable more definite prognostications to be made.

In certain cases, in-vitro cross-matching of blood for transfusion is unsatisfactory. For instance, a specific antibody may be found at room temperature which may not react significantly at body temperature, or there may be weak reactions of a non-specific antibody causing confusion or doubt. P. L. Mollison and M. Cutbush[1] have been carrying out work in which small quantities of red cells labelled with radioisotopes are injected, and their survival in or disappearance from the circulation is followed up. Suspensions of the donor's cells are labelled with either radioactive phosphorus or radioactive chromium (Cr^{51}), a measured amount is injected intravenously, and red-cell counts are made at intervals to determine the number of labelled cells present. Two patterns by which incompatible cells are eliminated have been observed. In the first, 50% to 100% are destroyed within ten minutes, and the remainder are later destroyed at a much slower rate; in the second, the cells are eliminated at a steady rate over some forty to sixty minutes. The authors suggest that measurements of this nature can be used when in-vitro tests of compatibility give doubtful results, and undoubtedly there must be occasions when biological tests of this type would be invaluable.

UNSUSPECTED GALL-STONES.

SEVERAL writers have reported that routine palpation of the gall-bladder, in patients on whom laparotomy had been performed for various reasons not in any way connected with the gall-bladder, has revealed the presence of gall-stones in a surprisingly large number of instances. Charles W. Mayo and James H. Rickman,[2] during 1953, investigated on these lines a series of 196 patients over the age of forty who were operated on for malignant disease of the stomach. In 13 of these gall-stones could be palpated, and while seven of these patients were known to have gall-stones prior to operation, in the other six nothing in their history or examination even hinted at the presence of the stones. In addition, the series included nine patients who had previously been operated on for gall-stones and one for unspecified gall-bladder disease, and 11 whose gall-bladders were found to be pathological at operation, though no stones could be palpated. In summary, of 196 patients 34 had present or past gall-bladder trouble; six of these had gall-stones and nine had pathological gall-bladders, all previously undiagnosed.

The problem discussed by Mayo and Rickman concerns the procedure to be followed when previously unsuspected

[1] *Lancet*, July 2, 1955.
[2] *J. Bone & Joint Surg.*, April, 1955.

[1] *Lancet*, June 25, 1955.
[2] *Arch. Surg.*, May, 1955.

gall-bladder disease is discovered at laparotomy. They point out that after any operation the withholding of food and the administration of stasis-inducing drugs such as morphine favour stagnation and concentration of bile. At the first feeding the gall-bladder tries to empty its viscid contents; the presence of stones may increase the difficulty of this emptying, and even precipitate an acute attack of obstructive cholecystitis, which may be unnoticed in the general post-operative upset. Moreover, a recent survey of 150 patients with non-functioning gall-bladders who had refused operation, revealed that 27% of these patients had been operated on within the next two years for serious complications. Mayo and Rickman conclude that whenever it is practicable the gall-bladder should be palpated during any abdominal operation, and that when any stones are found, cholecystectomy should be performed if the circumstances permit. If cholecystectomy is not able to be performed at the time, the possibility of the development of obstructive cholecystitis during the post-operative period must not be forgotten, and later the patient must be warned of his condition and advised as to future procedure. In view of the relatively high percentage of unsuspected cases of gall-stones and gall-bladder dysfunction which is revealed by these authors, their advice must obviously be given careful consideration.

THE DETERMINATION OF BLOOD PRESSURE IN INFANTS.

NOT only is the determining of blood pressure in small infants difficult, and likely to give inaccurate results, but the need for it seldom arises. If need should arise, the "flush method" is simple and accurate. J. Reinhold and M. Pym[1] have carried out a series of observations on infants, and have shown that this method gives constant and satisfactory results. It consists in applying a sphygmomanometer cuff, six centimetres wide, to the leg of the patient and, before inflating it, wrapping an elastic bandage from the toes up to the edge of the cuff. The cuff is then inflated to well above the expected systolic pressure, and the bandage is removed. The foot is at this stage blanched; it must be warm, as chilling interferes with the result. The pressure in the cuff is then released slowly at a rate not faster than five millimetres of mercury per second. An assistant should manipulate the valve and watch the manometer while the observer watches the foot. The manometer reading at the first sign of flushing as the blood returns to the foot is taken as indicating the systolic pressure. If the patient struggles or cries the systolic blood pressure rises, so that to ensure accurate readings it is wise to start a feeding when the test is about to be carried out. During the first two months of life the systolic pressure in the legs is slightly lower than that in the arms; thereafter this relationship is gradually reversed. In two patients with coarctation of the aorta, however, there were differences of 40 and 52 millimetres of mercury between the readings from arms and legs. Infrequent as the need for estimating the blood pressure of infants may be, knowledge of this method may nevertheless prove to be useful some time.

THE CLASSICS AND MEDICINE.

THERE has been a deplorable tendency in recent years to drop the classics as a prerequisite for those entering the medical faculties of our universities. Even if one disregards the general educational value of learning Latin and Greek, it cannot be denied that both these languages are indispensable to the understanding of the vast majority of medical terms in use today.

Therefore it was with envy that we read an article entitled "*Das lange i—Eine Bemerkung zur medizinischen Prosodie*" ("The Long 'I'—a Note on Medical Prosody") by Professor Dr. J. Steudel, of the Medical History Institute of Bonn University.[1] In this article the author lists a number of instances in which an originally long Latin "I" has been shortened and subsequently lost its accent in modern medical language. The author proves his point by quoting, with evident facility, Latin verses which contain the word under discussion and shows that, in each case, the "I" was originally long and accented. For example, the following lines from Catullus,

> "Quod quísque mínxit, hóc sibí solét máne
> Dentem átque rússam défricáre gingívam",[2]

prove that the original pronunciation was "gingíva".

After admiring the author's display of classical knowledge, we proceeded to compare English and German pronunciation of medical terms, and were gratified to find that at least in some of the cases listed by Professor Steudel the English language has preserved the correct pronunciation of the long "I", namely, "prurítus", "umbilícus", which, in German, are accented on the third last syllable. On the other hand, in words like "rétina", modern English commits the same error as modern German.

In fairness to the Germans it must be pointed out that in German pronunciation there is very little difference between long "I" (pronounced as in "fee") and short "I" (as in "fit"), while in English the difference between the two sounds (long, as in "nigh", and short, as in "fit") is quite marked.

We are not trying to imply that every doctor should be a classical scholar of the calibre of Professor Steudel, but a basic knowledge of Latin and Greek would undoubtedly help our understanding of medical terminology.

LEUCHÆMIA AND X IRRADIATION.

VARIOUS REPORTS that patients who had been treated for ankylosing spondylitis with X rays had subsequently died of leuchæmia prompted W. M. C. Brown and J. D. Abbott[3] to investigate the death rate from leuchæmia in Great Britain. Reports from all the radiotherapy centres in the country were collected, the figures were subjected to statistical analysis and then contrasted with the total death rate due to leuchæmia. In a series of 9364 patients treated with X rays between 1940 and 1954 for ankylosing spondylitis, the actual number of deaths from leuchæmia was at least five times the calculated expectation of deaths from that disease; among those patients who were given more than one course of X-ray therapy the actual deaths were about nine times those expected. These figures are statistically significant; when to them is added further evidence from the literature, such as the reported increase in the death rates from leuchæmia in Nagasaki and Hiroshima since 1945, isolated reports of the development of leuchæmia in patients some years after treatment of other diseases by X rays, and increases in death rates from leuchæmia among persons exposed to ionizing radiations and among radiologists, the conclusion that X irradiation can be a factor in the ætiology of leuchæmia is justifiable. However, there is also some evidence that patients who suffer from ankylosing spondylitis are also predisposed to leuchæmia.

Nevertheless, even if both these hypotheses are correct, the recorded deaths from leuchæmia after X irradiation totalled only 21 among 9364 patients; allowing for proportionate figures among those who could not completely be followed up, there might possibly have been 37 deaths from leuchæmia. Expected deaths based on the general leuchæmia death rate would have been four. If X-ray treatment for ankylosing spondylitis is of any value—and it appears to be—then the possibility of multiplying by nine the risk of leuchæmia's developing is more than offset by the benefits to be gained by running this risk. What does emerge is the certainty that prolonged courses of X-ray treatment should not lightly be ordered, and second courses should be avoided if at all possible.

[1] *Arch. Dis. Childhood*, April, 1955.

[1] J. STEUDEL (1955), *Deutsche med. Wchnschr.*, 13: 453.

[2] Catullus, attacking Egnatius the Spaniard. (Translation: According to local custom he used to clean his teeth and gums with urine every morning.)

[3] *Lancet*, June 25, 1955.

Abstracts from Medical Literature.

PATHOLOGY.

Bilateral Brenner and Krukenberg Tumours with Ovarian Cystadenomata.

C. J. FLANAGAN AND G. J. RACE (*Arch. Path.*, December, 1954) report an unusual case of bilateral multiple ovarian tumours. The tumours studied were bilateral Brenner tumours, bilateral benign cystadenomata and bilateral Krukenberg tumours. Each ovary weighed approximately 1200 grammes; four-fifths of the ovarian tissue was estimated to consist of Brenner tumour. The cystadenomata were of mixed serous and pseudomucinous type. The Krukenberg tumours were secondary to an adenocarcinoma of the stomach.

The Pathology of Regional (Segmental) Colitis.

H. W. NEUMAN AND M. B. DOCKERTY (*Surg., Gynec. & Obst.*, November, 1954) describe the gross and microscopic features of the lesion in regional (segmental) colitis, as observed in 25 resected specimens. They state that the predominant gross features are ulceration of the mucous membrane and thickening of the wall. Microscopically the lesion is a non-specific subacute and chronic granulomatous inflammatory process involving the entire thickness of wall. The authors' observations differ from those of Warren and Sommers, who stated that, in non-specific ulcerative colitis as a whole, the inflammatory process is exudative and reparative, without any granulomatous tendencies. The lesion in the ileum is practically identical with that in the colon. Microscopically the lesion does not extend more than six centimetres beyond the gross limits of the lesion. Failure to excise as widely as sometimes is suggested beyond the gross limits of the lesion would not seem, then, to be a significant factor in recurrence. Gross mesenteric lymphadenopathy is met with only occasionally. Focal granulomata are present in the mesenteric lymph nodes, but the granulomatous nature of the lesion is not as uniformly apparent or as marked as in the wall of the intestine. The authors suggest that the earliest pathological lesion in the intestine may be purulent cryptitis, followed subsequently by microscopic abscess formation and ulceration of the overlying mucosa.

Early Joint Lesions of Rheumatoid Arthritis.

J. P. KULKA, D. BOCKING, M. W. ROPES AND W. BAUER (*Arch. Path.*, February, 1955) describe the clinical and anatomical findings in eight cases of chronic symmetrical polyarthritis which fulfilled accepted clinical criteria required for the diagnosis of rheumatoid arthritis, and in which knee biopsies were performed from seven days to nine months after the onset of symptoms or signs in the respective joints. Marked variations from case to case and regional variations within the same joint made comparison of the tissue changes difficult. However, these relatively early and active articular lesions differed from the classical descriptions of the permanently deforming stage of rheumatoid arthritis in showing a closer resemblance to the type of tissue reaction characterizing the subcutaneous nodules and other systemic lesions of the disease. Diffuse proliferative synovitis was a dominant feature in every instance. In the two earliest and mildest lesions (of seven and nine days' duration, respectively), this reaction was confined almost entirely to the intima. Typical lymphocytic nodules and villous hypertrophy were found only in three lesions, all of which were of more than four months' duration. Evidence of more intense and localized injury was also a constant finding. Such injury was frequently superimposed on the diffuse proliferative process, but varied independently in its degree of development and at times involved the fibrous joint capsule or articular cartilage. The involved regions were characterized by one or more of the following features, which correspond to those of rheumatoid nodules: (*a*) superficial or interstitial formation of fibrin or fibrin-like deposits, (*b*) necrobiosis, (*c*) minimal to moderate inflammatory cell reaction, usually mononuclear in type, (*d*) intense patchy œdema and proliferation of large primitive-appearing connective tissue cells, and (*e*) focal disruption of extracellular fibres and sequestration of thick hyalinized collagenous bundles. Focal or segmental vascular changes, involving particularly venules and capillaries, were associated in most instances with both the diffuse synovitis and the regions of intensified tissue injury. These changes consisted of inflammatory cell infiltration, hypertrophic thickening, with narrowing of the lumens, perivascular hæmorrhages or hæmosiderin deposits, and, occasionally fibrin permeation or thrombosis.

Fatal Fulminant Acute Carbon Tetrachloride Poisoning.

R. B. JENNINGS (*Arch. Path.*, March, 1955) reports eight cases of fatal carbon tetrachloride poisoning. On the basis of clinical and pathological findings the cases are grouped into anæsthetic, renal failure and fulminant (probably hepatic failure) groups. Special emphasis is placed on the fulminant group, consisting of four cases in which the patients died within ninety-six hours of exposure to this poison, as this group has not been described previously. These cases are characterized by a rapid clinical course, fat infiltration and massive necrosis of the liver, and fat nephrosis.

Lipomata of the Gastro-Intestinal Tract.

T. WEINBERG AND M. FELDMAN (*Am. J. Clin. Path.*, March, 1955) state that lipomata of the gastro-intestinal tract are submucosal and subserous fatty tumours, the majority of which are small and present no symptomatology. Since the greater number of lipomata are asymptomatic, the clinical and surgical incidence is much lower than that found at autopsy. In 1319 necropsies, the authors found 77 cases of lipoma in the gastro-intestinal tract, an incidence of 5·8%. In a review of the literature they found that the reported incidence of lipoma of the gastro-intestinal tract was statistically not correct, because most of the surveys dealt chiefly with surgical cases, neglecting the far greater number encountered at autopsy. In most of the recorded clinical cases, the patient had some complication which necessitated surgical intervention. The complications commonly encountered with lipomata were intussusception, obstruction and ulceration. In a small number of cases, the lipoma was spontaneously expelled. The authors state that lipomata may occur anywhere in the alimentary tract, but are most common in the small and large intestine. Multiple lipomata occur frequently. In 77 cases in which autopsy was carried out, there were 20 cases with multiple lipomata. Lipomata of the gastro-intestinal tract are not generally diagnosed pre-operatively. Occasionally the tumour is demonstrated radiologically, but the appearance of these tumours is similar to that of other benign growths.

Involvement of Internal Mammary Lymph Nodes in Carcinoma of the Breast.

J. P. WYATT, E. D. SUGARBAKER AND M. F. STANTON (*Am. J. Path.*, January-February, 1955) found that of 60 cases of primary cancer of the female breast secondary growths were present in the internal mammary lymph nodes in 19, and in seven instances these nodes alone showed metastatic tumour deposits. They state that this relatively high incidence of internal mammary nodal involvement reaffirms and emphasizes the importance of the anatomical and functional role of this lymphatic pathway from the breast. The primary cancer was located in the medial half of the breast in 13 instances and was subareolar in 14. From these two sites alone metastatic tumour within the internal mammary nodes was found in 15 cases. This tumour-spread along the internal mammary pathway from malignant epithelial growths of the mesial half of the breast is, as far as ultimate biological behaviour is concerned, probably of greater importance than spread along the axillary channels.

Hepatic Fibrosis after Treatment of Acute Leuchæmia with Folic Acid Antagonists.

J. COLSKY, E. M. GREENSPAN AND T. N. WARREN (*Arch. Path.*, February, 1955) state that five of seven children ill with leuchæmia developed significant remissions of the disease process after treatment with aminopterin or amethopterin. In these five children laboratory and clinical signs of hepatic fibrosis appeared after prolonged therapy with anti-folic-acid compounds. On post-mortem examination of these patients there was histological evidence of extensive hepatic fibrosis. The ætiological factors causing these changes are not known. It is suggested that a combination of factors—hepatic injury following the dissolution of leuchæmic infiltration in the liver by treatment, failure of normal healing to take place beacuse of interference with utilization of normal

metabolites, and a greater susceptibility of the liver of young patients to metabolic antagonists—may have resulted in the development of the hepatic fibrosis.

MORPHOLOGY.

Innervation of Human Teeth.

R. COCKER AND J. M. HATTON (*J. Anat.*, April, 1955), by the combined use of slow decalcification and a modified silver staining technique, have confirmed the course of nerve axons in the pulp and predentine of human teeth. In addition the method has shown for the first time a small number of axons penetrating deeply into the calcified dentine of human teeth.

Perivascular Spaces of the Mammalian Central Nervous System.

D. H. M. WOOLLAM AND J. W. MILLEN (*J. Anat.*, April, 1955) state that accounts in the literature of the subarachnoid spaces are confused and contradictory owing to the complexity of tissue layers involved, and the difficulty in obtaining a suitable indicator which, on being injected, serves to outline these spaces. In the present investigation, two groups of experiments were performed. In the first group the single injection of indian ink into the subarachnoid space of the adult rat was followed two hours later by the intravenous administration of hypertonic saline. In the second group the subarachnoid injection of colloidal carbon daily in the newborn rat from birth to about three weeks of age served to outline the perivascular spaces. In both groups the brain and spinal cord were removed, fixed, sectioned, stained and examined histologically. It was found that there were two spaces surrounding the blood vessel in the central nervous system. The first was the true perivascular space which communicated with the subarachnoid space but not with the perineuronal spaces. External to this true perivascular space lay an artefact space which communicated with the perineuronal spaces and with the epispinal space of His between the *pia mater* and the surface of the brain and spinal cord, but not with the subarachnoid space. All these spaces were artefacts, the results of shrinkage consequent on fixation and sectioning.

Development of Microglia.

E. J. FIELD (*J. Anat.*, April, 1955) states that he has confirmed all Hortega's observations on the development of microglia (so far as they went), but in the present work is concerned mainly with the more controversial question of the early appearance of microglia. Since Hortega's studies some thirty years ago it has been widely accepted that microglia is of mesodermal origin and makes its appearance in the central nervous system in the last stages of fœtal development, being especially conspicuous about the time of birth, when "fountains" of immature microglial cells are to be seen invading the brain in certain localities such as the root of the *tela choroidea*. The present author reports the presence of mature microglia in early stages of embryonic development. Certain "foamy" microglial cells met with in the present work become prominent late in development, but do not contain sudanophilic (fat-stainable) material. Their possible relation to the process of myelination which progresses at this time is briefly discussed. Additional evidence for the mesodermal origin of microglia and its invasion *en masse* around the time of birth is afforded by studies of cortisone-treated rats. The author states that microglia probably arises from an early blood element and confirms its mesodermal origin.

Excision and Reimplantation of Epiphyseal Cartilage.

P. A. RING (*J. Anat.*, April, 1955) has studied the effect on bone growth of excision and reimplantation of the epiphyseal cartilage. He states that if the epiphyseal cartilage is replaced in its normal position, the subsequent growth of the bone is undisturbed. Excision and reversal of the epiphyseal cartilage lead to enlargement of the bony epiphysis, the cartilage retaining its original polarity. Growth of the bone following reversal of the epiphyseal cartilage is slow, and ceases after six to eight weeks.

The Part Played by the Tongue in Mastication.

SHAFIK ABD-EL-MALEK (*J. Anat.*, April, 1955) states that the action of the tongue in mastication has been observed in subjects who have lost some of their teeth. The tongue takes part in all stages, defined as those of "preparation" when the tongue becomes trough-like, "throwing" the food between the teeth, "guarding" the food from falling back from the teeth, "sorting out" the particles and "bolus formation", and in swallowing. The muscles of the right side of the tongue throw the food between the left grinding teeth and prevent it from escaping during chewing movements; this explains why the patient suffering from hemiplegia is forced to chew on the paralysed side.

The Arterial Supply of the Human Prostate and Seminal Vesicles.

E. J. CLEGG (*J. Anat.*, April, 1955) states that much of the difficulty experienced in evaluating and comparing work on vascular anatomy is a result of lack of uniformity in nomenclature, and the literature on the arterial system in the region of the human prostate and seminal vesicles is no exception. The object of this report is to describe in some detail the blood supply to the human prostate and seminal vesicles, to compare the various systems of nomenclature used by previous workers, and to provide an accurate representation of the vascular patterns as a basis for surgical practice. In a total of 21 pelvic halves, the blood supply to the prostate gland and seminal vesicle was studied by dissection and by radiological examination. A definitive prostatic artery was found in all cases examined; it was the most constant branch of the prostato-vesical artery. The superior rectal artery was found to supply the gland in 31·2% of cases, a much higher figure than that of Awataguti (1939). The vesico-deferential artery was found to supply the seminal vesicle in all cases through its anterior vesicular branch (author's terminology). In eight cases out of fifteen the posterior vesicular artery (author's terminology) was a branch of the prostato-vesical artery, and in six cases a branch of the gluteo-pudendal trunk. It is considered that variations in the nomenclature of blood vessels in this region account, in the main, for the wide diversity of findings in the blood supply of the prostate and seminal vesicles.

SURGERY.

Failure of Polyethylene Wrapping in Treatment of Aortic Aneurysms.

M. DE BAKEY, O. CREECH, JUNIOR, D. COOLEY AND B. HALPERT (*Arch. Surg.*, January, 1955) report eight cases of aneurysm of the abdominal aorta previously treated by polyethylene wrapping and subsequently resected after intervals varying from seven to forty-one months. They state that although symptomatic improvement followed the wrapping procedure in some patients, there was recurrence of symptoms and increase in size of the aneurysm in all patients. Examination of the resected aneurysm revealed that the fibroblastic reaction was inadequate for significant reinforcement of the aneurysmal wall. The authors conclude that the reaction induced by the implanted polyethylene did not alter the natural course of the aneurysm favourably to the patient. Furthermore, they consider that the wrapping procedure may have had an unfavourable effect by its potential tendency to devitalize the sac.

Transmetatarsal Amputation for Ischæmic Gangrene.

H. HAIMOVICI (*Arch. Surg.*, January, 1955) reports a study of 56 patients on whom 59 transmetatarsal amputations were performed. The post-operative mortality was 5·3%. Stump healing after primary closure occurred in 73·9% of cases, and after an open procedure in 90%. Overall healing occurred in 77%. A follow-up study of 41 patients showed that 37 had good functional results and four had late gangrene requiring a mid-thigh amputation. The author states that transmetatarsal amputation may be successfully performed in patients with (*a*) well demarcated lesions of one or more toes, (*b*) well controlled infection, and (*c*) adequate collateral circulation at the level of amputation. Unfavourable factors militating against a successful mid-tarsal amputation are (*a*) marked blanching of the forefoot on elevation, (*b*) a sharp drop in skin temperature from mid to fore foot, and (*c*) persisting severe rest pain. The author points out that one great advantage of this amputation is that it allows walking without a prosthesis.

On the Periphery.

THE BEATEN TRACK.

SOME years ago a purveyor of paradoxes declared that when at a distant future date the contribution of the Anglo-Saxon to civilization was critically studied and assessed, it would not be Shakespeare and Newton, parliamentary government and the founding and development of a great tradition in sport which would be placed first, but most likely the invention of the water-closet. It can with fairness be claimed that the Anglo-Saxon since the early eighteenth century has been ahead of other races in personal and general cleanliness. At the height of the splendour of France under Louis XIV the Parisian streets were noticeably below those of London as regards the presence of litter, excrementitious matter and offensive odours; that there was a similar superiority in personal cleanliness is not so easy to prove, but it is very likely. The nineteenth century ushered in a change in the English attitude towards cleanliness of person, clothing and immediate environment. Beau Brummell undoubtedly played a great part in this reform; snuffing with its heavy powdering of waistcoats and floors also, and particularly spitting, were no longer permitted in good society. We learn that before his day new carpets soon looked shabby through the habit, objectionable to us now, of men, even of the best social rank, spitting freely and treading on the sputum with their shoes. Brummell also introduced the morning tub which preluded the morning bath or shower. The more civilized nations came eventually into line, but at different rates. For many years the beautiful cities of the Côte d'Azur dared not publish their typhoid statistics for fear of injuring the tourist traffic; visitors who had been warned about the water often forgot that salads are unsterilized, and to salads may be attributed much of the typhoid infestation. Mark Twain has humourously described in "A Tramp Abroad" how the hotels in the backward Swiss cantons were plagued by fleas which he called the true Swiss chamois. Cologne in Coleridge's time was a city of a thousand stinks; with the unification of Germany after the Franco-Prussian war came a great improvement, though peasant life still leaves much to be desired. No country has shown such continued progress in general and personal hygiene as the United States, which now leads the world. Recently an international organization held a congress in Paris, and intending American visitors were warned that as Parisian hotels were mostly old the luxury of a bathroom and toilet attached to each bedroom was not to be expected.

The adoption of higher standards of public health and personal cleanliness by some communities and not by others has led to a big reduction in the attraction formerly exerted by places off the beaten track. English-speaking peoples, now sophisticated, hesitate to eat what is suspect in origin or preparation. Many heads of families simply refuse to bring their children to resorts where pasteurized milk is not available, whilst the slightest suggestion of dirt or vermin, of previous use of bedclothes without laundering, or of a trace of offensive odour will lead a prospective tenant to beat a hasty retreat. It is doubtful whether a modern Borrow would care to fraternize with gipsies and Spanish peasants and eat out of the same pot. Those who are attracted by the Red Indian even of today must have strong stomachs to eat beans and portions of meat placed before them by squaws with unwashed hands, whilst the common Red Indian practice of using a pannikin for drinking-water and urine alternately arouses squeamish reflexes. "Comfort must not be expected by folks which go a pleasuring", wrote Byron about 140 years ago, and this disability, highly magnified, is true today. Primitive peoples can be admired when viewed from the safe shelter of a motor-car; but to eat their food, drink their milk or sleep in their sheets is quite a different matter and will not beget any romantic feelings. Nothing can so quickly quench interest and any historical appeal as abhorrence aroused by dirt with its conscious or subconscious suggestion of disease. It is true that convention plays a part in our likes and dislikes; we eat oysters alive, a practice which would be regarded with nausea by a Brahmin. Still admitting a few such conventions, we find that the great majority of our taboos are based not on religious ritual or tribal tradition, but on the broad foundation of pathology. Hence the very modern aphorism that "the beaten tracks are the best tracks".

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British Medical Association News.

SCIENTIFIC.

A MEETING of the New South Wales Branch of the British Medical Association was held at the St. George Hospital, Kogarah, on November 18, 1954. The meeting took the form of a series of clinical demonstrations by members of the medical and surgical staff of the hospital. Part of this report appeared in the issue of July 9, 1955.

Myxosarcoma of the Shin following Injury.

DR. W. J. PULLEN showed a man, aged seventy-seven years, who had received a severe blow on the upper part of his right leg during a railway accident in December, 1953. Subsequently a lump developed, which had increased in size during the last three months. In April, 1954, when he was first examined, he had a tumour three and a half inches by three inches in area, situated on the upper third of the medial aspect of the right tibia. The tumour had no irregular outline, was not attached to the skin and appeared to be attached to the periosteum. X-ray examination of the bone, and blood Wassermann and Kahn tests revealed no abnormality. In May, 1954, the tumour was excised, and Dr. A. E. Gatenby, the pathologist, reported that the specimen was a flat, semi-solid tumour measuring three and a half inches by three inches by one and a half inches. It appeared to be enclosed in fat and fibrous tissue, but had no distinct capsule. In the cut surface loculated areas of greenish myxomatous material were present. Microscopic examination of the tumour showed the structure of fibrolipoma undergoing sarcomatous and myxomatous changes. It appeared to penetrate into the surrounding connective tissue. There was, in addition, superadded inflammatory infiltration, and Dr. Pullen said that since the operation the wound had healed and there had been no recurrence. The condition was regarded as a malignant tumour, a myxosarcoma which had followed a definite localized injury.

Hirschsprung's Disease.

Dr. Pullen's second patient, a boy, aged twelve years, had been examined at the out-patient department in April, 1954, having been referred by an outside doctor with a diagnosis of retroperitoneal lymphosarcoma. The child had been off colour for two days with a headache, but was otherwise in his usual health. His mother said that he had had no abdominal pain or abnormality of bowel action. He was found to have a hard mass arising out of the pelvis as far as the umbilicus and further extending up the left side of the abdomen. The mass was found to pit on pressure, and rectal examination revealed a large scybalous mass extending down to and just above the anal sphincter. The boy was thin and poorly developed. X-ray examination with a barium enema was carried out by Dr. C. D. Badham. It showed that the rectum was elongated and greatly dilated and rose to the level of the iliac crest. The remainder of the large bowel was very tortuous. It was difficult to separate and to see clearly the individual loops on account of the redundancy of the bowel. There was some general dilatation of the large bowel as far as the hepatic flexure, with a suggestion of constriction at the pelvi-rectal junction. Emptying of the bowel was poor, and the rectum remained very distended after evacuation of the enema. Treatment was instigated with enemata, but they were poorly tolerated, and the patient commenced taking a proprietary pill regularly of his own accord. This, with better bowel habits, had kept him in reasonable health. However, he still had a tumour the size of a fœtal head arising out of the pelvis. Dr. Pullen said that the child had been shown as he had presented an interesting diagnostic problem in the first instance. Now he seemed to have little disability from his megacolon, and no further interference was contemplated at the moment. The child still maintained that his bowel habits were regular.

Foreign Body in the Orbit.

Dr. Pullen's third patient, a boy, aged two years, had been playing in a new building, and ran in to his mother with a quarter-inch nail protruding from below the right lower eyelid in a vertical line just medial to the pupil. Otherwise the child was unaffected, and there was no interference with the movements of the right eyeball. X-ray examination showed the full two inches of the nail directed head first and lying slightly obliquely, inwards and medially so that it reached the mid-line. It had pierced the lateral wall of the nasal cavity and appeared to reach the pituitary

fossa. The child was taken to the operating theatre, and under general anæsthesia the nail was removed without difficulty or disability by pulling on its exposed end. Dr. Pullen said that the patient was shown because of the impressive appearances of the nail in the X-ray films and the ease of treatment. There was no damage to the eyeball, and the child was discharged from hospital two days after operation.

Recto-Colectomy for Ulcerative Colitis.

Dr. Pullen then showed a woman, aged forty years, who had been first examined in 1954, when she gave a history of intense abdominal heaviness for twelve months, the passage of bloody motions for nine months, and abdominal pain and diarrhœa for three months. Her weight had dropped from twelve stone to six stone. On examination she was found to be an ill, anæmic woman with a tender, palpable colon. X-ray examination with a barium enema and sigmoidoscopic examination confirmed the diagnosis of ulcerative colitis. Laboratory examinations revealed no evidence of amœbic, typhoid, paratyphoid, Brucella or Proteus infection. Her serum protein content was 4·3 grammes *per centum*, made up of albumin 2·5 grammes and globulin 1·8 grammes *per centum*; the albumin-globulin ratio was 1·4:1·0. The thymol-turbidity test result was 1·8 units, and the serum alkaline phosphatase content was 10·1 King-Armstrong units. She was treated without real benefit with chloramphenicol, penicillin, streptomycin, bismuth, iodide, cortisone and ACTH. Repeated blood transfusions were necessary. In June, 1954, excision of the colon with anastomosis of the ileum and the upper part of the rectum, as advocated by Aylett, was carried out in an attempt to avoid an ileostomy. After a stormy post-operative period the patient's general condition improved a little, but hæmorrhage still continued *per anum* and she needed repeated transfusions. The residual rectum contained many ulcers and a recto-vaginal fistula developed. In July, 1954, the ileo-rectal anastomosis was resected, the upper part of the rectum was closed and a formal ileostomy was made. Again, after a stormy few days, she began to make remarkable progress with returning appetite and increasing weight, though she still continued to pass bloody mucus *per anum*. The residual rectum was resected in August. During the course of her illness the patient received 40 bottles of blood. The pathologist, Dr. Gatenby, reported that macroscopic examination of the excised bowel showed the presence of myriads of polypoid projections commencing within four inches of the caecum and extending to the distal segment of the bowel. No normal mucosa was seen. Microscopically, the bowel was seen to have chronic inflammatory changes which extended through to the serosal surface. The appearance was in keeping with the diagnosis of idiopathic ulcerative colitis. Dr. Pullen commented that the case would confirm the opinion that anastomosis of the ileum to the upper part of the rectum had no place in the treatment of ulcerative colitis.

Basal-Celled Carcinoma of the Forehead.

Dr. Pullen's last patient was a woman, aged thirty-nine years, an invalid pensioner suffering from Parkinson's disease. She had had a swelling of her forehead for twenty-four years; this had increased in size over the past twelve months. On examination, she was found to have a whitish, thickened area extending from the base of the nose to the hairline and occupying the centre half of her forehead. It was ulcerated at one point. A biopsy taken in August, 1954, showed the presence of an infiltrating basal-celled carcinoma. In September, 1954, the lesion was excised and a dermatome graft applied to the area. Apart from some infection at the edges, the graft took well and the patient was discharged from hospital three weeks later. The pathologist, Dr. Gatenby, stated that the piece of skin removed contained extensive basal-celled carcinoma. Dr. Pullen commented that the patient was presented to show the good cosmetic result obtained from a dermatone graft. It was also unusual to see such an extensive basal-celled carcinoma in so young a person, especially without involvement of the underlying bony structure.

Bone Cyst.

DR. A. L. WEBB showed a boy, aged fifteen years, with a cyst of the *os lunatum* of the right hand. It was possibly traumatic in origin and caused much pain and disability of the wrist. In an effort to preserve the radio-carpal articulation, the cyst had been removed and the *os lunatum* preserved.

Septic Arthritis.

Dr. Webb then showed a female infant, who had been admitted to hospital at the age of three weeks with bilateral septic arthritis of the shoulders. Eight days after birth the child's left shoulder had become swollen, and a little later the right shoulder also had become swollen. It was noticed that the baby had not lifted her arms since birth. On the child's admission to hospital, both shoulders were found to be swollen and tense, and X-ray examination showed the presence of fluid in both joints. Parenteral penicillin therapy had produced no improvement after three days. On aspiration of both shoulders, much thick pus was obtained and penicillin was instilled into the joints. Streptomycin therapy was commenced soon after. Aspiration was repeated eight days later, and at the end of three weeks the swelling had cleared up and the infant was moving her arms naturally. The child had been followed up subsequently, and recent examination had shown that full movement was possible in both shoulders, but no clinical or radiological evidence of an upper epiphysis was present. The adjacent areas of the humerus were widened and somewhat splayed. The organism responsible was found to be *Staphylococcus aureus*, moderately sensitive to "Aureomycin" and streptomycin, but not sensitive to penicillin.

Traction Injury of Right Brachial Plexus.

Dr. Webb's last patient was a man who had sustained multiple injuries in May, 1953, of which the outstanding was a traction injury of the right brachial plexus. The whole right upper limb was paralysed and intensely painful. Partial recovery had taken place, leaving him with a right hand of little use. Tendon transplants on September 28, 1954, had improved function. He was shown at an intermediate stage in recovery.

Acrylic Head Arthroplasty.

DR. C. MAXWELL showed two patients who had undergone acrylic head arthroplasty of the hip. The first patient, a man, aged twenty-nine years, had had a painful right hip for five years. Flexion was limited to approximately 30°, abduction to approximately 15°, and extension to approximately 20°. X-ray examination showed osteoarthritis of the hip. He was admitted to hospital in April, 1954, for acrylic head arthroplasty and remained in hospital for four weeks after operation. Since then, progress had been good.

The second patient was a woman, aged sixty-seven years, who had had a painful right hip for four years. She walked with a limp, had flexion to about 70°, minimal rotation and tenderness on manipulation. X-ray examination showed gross osteoarthritis of the right hip joint. She was admitted to hospital in September, 1954, for Judet's arthroplasty and was in hospital for four weeks after operation. She was now walking without a cane and progressing well.

Osteomyelitis of the Ilium.

DR. A. I. RHYDDERCH showed a girl, aged sixteen years, who had come to the hospital's out-patient department in May, 1954, with the history that she had experienced pain in the right groin in December, 1953. She felt ill, was unable to put her foot on the ground without pain and was feverish, and she was confined to bed by her own doctor. X-ray examination of the hip region disclosed no abnormality, and the condition was regarded as fibrositis. She remained in bed for one month and returned to work after a further month. Early in May, 1954, a painless swelling had appeared in the groin just below the anterior superior iliac spine. After two weeks, the overlying skin became reddened and she sought further advice. The abscess was excised under local anæsthesia. X-ray examination showed considerable sclerosis of the right ilium, alternating with areas of translucency which were considered to be suggestive of chronic osteomyelitis. No obvious sequestrum was visible. Examination of the patient at the out-patient department showed a small, practically healed scar one inch below the anterior superior iliac spine. The iliac crest was obviously thickened, but only slightly tender. Hip movements were full. In order to exclude a new growth, biopsy was performed on June 30, 1954, when the iliacus muscle was shown to be œdematous and fixed to the inner table of the ilium. On removal of a portion of the inner table of the bone, pus and necrotic tissue were encountered. No organisms could be grown from the pus recovered, though it contained numerous pus cells. Examination of the bone section revealed inflammatory changes, but no evidence of tuberculosis or new growth. The patient was given intensive antibiotic therapy and the wound was closed primarily. Dr. Rhydderch said that the patient had remained well up to a few days before the time

of the meeting. At the moment, she was having slight dragging pain in the right groin at the end of each day.

Osteochondritis Dissecans of the Knee.

Dr. Rhydderch's second patient was a man, aged twenty-one years, who had injured his knee in April, 1954, whilst playing soccer. The injury was accompanied by a twisting strain. He was unable to straighten the knee fully, and effusion appeared within a few hours. Since the original injury, the left leg had locked on many occasions without much pain or recurrence of effusion. Periodically he had felt a loose body in the suprapatellar pouch. Examination of the patient's left knee disclosed wasting of the left quadriceps, but there was no effusion and the range of movement was full. Local tenderness was present in the medial femoral condyle. X-ray examination showed a small area of *osteochondritis dissecans* in the medial femoral condyle. No radio-opaque loose body was visible. The left knee was explored on October 13, 1954. A loose body the size of an almond was removed from the suprapatellar pouch. The softened, irregular articular cartilege surrounding the crater in the femoral canal was excised. The patient's convalescence was uneventful.

Elbow Dislocation with Inclusion of the Medial Epicondyle Epiphysis.

Dr. Rhydderch's last patient was a man, aged thirty-four years, who had fallen off a truck in August, 1954, injuring his left elbow. The joint was obviously out of alignment, but his companions pulled the arm and he felt the joint slip back into position. He also noticed that his ring and little fingers were numb. He consulted his own doctor, who arranged for X-ray examination of the elbow. This disclosed a large, smooth fragment of bone, which was lying within the medial side of the elbow joint and had almost certainly been detached from the medial aspect of the lower end of the humerus; but its exact point of attachment was not obvious from the X-ray film. Nine days after the accident, the left elbow was explored by a medial approach. The fragment was found to be firmly attached to the flexor origin and was readily withdrawn from the joint; it was completely surrounded by fibrous tissue. The medial ligament of the elbow had been completely ruptured, so that the elbow was rendered unstable. The fragment was restored to its correct position and held in place by Kirschner wire fixation. The elbow was immobilized for five and a half weeks. Dr. Rhydderch said that the joint was now quite stable. Movement was returning slowly, and at present the range of movement was from 70° to 125°. The ulnar nerve, which was the seat of a neuropraxia, was recovering; hypoæsthesia was now restricted to the little finger. After the operation had been performed, the patient admitted to having injured the elbow in childhood, so that several weeks' immobilization had been necessary. At that time, the medial epicondyle must have been separated. It had secured a fibrous attachment to the humerus. When the elbow was dislocated, the fragment was included within the joint. Such a condition was extremely uncommon.

Refractory Anæmia in Pregnancy.

DR. N. SAXBY showed a female patient, aged forty-three years, who had first come under his care in December, 1953, when she was two months pregnant. It was her fourth pregnancy, the other children being aged respectively eighteen, eleven and six years. All the previous pregnancies had been normal except for some mild hypertension in the third. Her one illness had been anæmia, and in the previous year she had had two courses of intravenous iron therapy and ten liver injections, with little relief. She looked pale and old. An apical systolic murmur could be heard, but the results of physical examination were otherwise normal, apart from the fact that her blood pressure was 180 millimetres of mercury, systolic, and 100 millimetres, diastolic. Examination of her blood revealed a hæmoglobin value of 7·8 grammes *per centum*, an erythrocyte count of 4,000,000 per cubic millimetre and a colour index of 0·7. The urine was normal on microscopic examination. The fasting blood urea content was 36 milligrammes per 100 millilitres and the urea clearance 82%. As her pregnancy went on, the blood pressure fell to about 160 millimetres of mercury, systolic, and 90 millimetres, diastolic. She was given ferrous sulphate by mouth, and at the thirty-fourth week of pregnancy her hæmoglobin value was still 7·8 grammes *per centum*. At the thirty-fifth week she had a blood pressure of 180 millimetres of mercury, systolic, and 105 millimetres, diastolic. She was admitted to hospital on June 10, 1954, put at rest in bed and given "Serpasil", phenobarbital and intravenous iron therapy. After that and until delivery at the thirty-eighth week, her hæmoglobin content remained 8·8 grammes *per centum*. She was given "Anahæmin" twice weekly from July 1. Her blood pressure at the thirty-seventh week was 180 millimetres of mercury, systolic, and 90 millimetres, diastolic, and then she was given "Vegolysin", ten milligrammes morning and evening. This caused a drop in blood pressure of about 50 millimetres of mercury, systolic, but the pressure soon rose again. On July 5 the patient was noticed to be slightly jaundiced, and on the next day she was more deeply so. Nausea, indigestion, tenderness and liver enlargement did not occur, but the spleen was slightly enlarged. The serum bilirubin content was raised to 3·5 milligrammes per 100 millilitres, the thymol turbidity was normal, the serum alkaline phosphatase level was raised to 24·8 King-Armstrong units, and bile pigments and salts were present in the urine. She came into labour spontaneously at the thirty-eighth week, on July 8. The liquor was meconium-stained, but the infant was normal. The patient lost six ounces of blood during labour. The jaundice faded after the birth of the baby, the bile went from the urine, and the serum bilirubin content became normal. At delivery all treatment was stopped. Her blood pressure rose as high as 230 millimetres of mercury, systolic, and 130 millimetres, diastolic, in the first week of the puerperium, so that treatment with "Serpasil" and later with "Provelle Malleate" was again instituted. On the second day of its life, the baby had widespread bruising, its hæmoglobin value fell to 6·6 grammes *per centum* and 120 millilitres of blood were administered. With this, and treatment with vitamin *K*, the baby made a good recovery. Occult blood was detected in the mother's fæces on July 12, and X-ray examination with a barium enema suggested localized ulcerative colitis in the sigmoid colon, but there were never any symptoms from this or obvious blood in the fæces. The results of sternal puncture and a fractional test meal examination were normal. On August 7 the patient was discharged from hospital, her hæmoglobin value then being 9·6 grammes *per centum*. Since then, she had been treated with "Fergon", and at the last estimation the hæmoglobin value was 11·2 grammes *per centum*.

Laryngofissure for Carcinoma of the Larynx.

DR. F. E. ELLIS presented two patients who had undergone laryngofissure for carcinoma of the larynx. The first, a man, aged sixty-two years, had come under observation in January, 1954, with a history of hoarseness of two months' duration. Examination of the patient revealed paralysis of the left vocal cord, the cord being very irregular with subglottic extension. There was no evidence of cervical gland enlargement. The chest appeared normal radiologically. The results of a Wassermann test were positive. Biopsy of the left vocal cord revealed the presence of epidermoid carcinoma, well differentiated (grade I, Broders classification). A second biopsy a fortnight later showed epidermoid carcinoma less well differentiated. A further fortnight later, left larygofissure and tracheotomy were performed. The pathologist reported that examination of a nodule from the left vocal cord showed islands of tumour throughout most of its extent. The cellular pattern was similar to that seen in the biopsy specimen. The tracheotomy was closed in March, 1954. The patient developed bronchopneumonia and pyelitis during the post-operative period, but subsequent progress was satisfactory.

The other patient was a man, aged sixty-eight years, who had sought advice in May, 1954, with a history of hoarseness of three months' duration. He had a large white tumour overlying the middle of the right vocal cord, but no cervical gland enlargement. Biopsy of the larynx revealed the presence of epidermoid carcinoma moderately well differentiated (grade I to II, Broders classification). A fortnight later, right laryngofissure was performed. The pathologist reported the presence of a verrucose area on the right vocal cord, which on microscopic examination was found to contain epidermoid carcinoma similar in pattern to that in the biopsy material. On the day after operation, severe hæmorrhage occurred round the tracheotomy tube. The patient was transferred to the operating theatre and the bleeding vessel was ligated. Four days later, the tracheotomy tube was removed and subsequent progress was satisfactory.

A Practical Use of Fœtal Electrocardiography.

DR. SYDNEY HING presented details of a case which illustrated a practical gynæcological application of fœtal electrocardiography in addition to its medical and academic interest. The patient, a multiparous woman, aged nineteen years, had been admitted to the St. George Hospital with a diagnosis of inevitable miscarriage. Her pregnancy was estimated to have been of twenty-four weeks' duration. She

had had a fall the previous month, after which there had not been any signs of fœtal movement. On admission to hospital the patient was having regular uterine contractions at five-minute intervals. Each contraction lasted about three minutes. Morphine and pethidine were administered. In addition, she had lost a large clot of blood *per vaginam* each day. The resident medical officer reported that the membranes had ruptured shortly after her admission to hospital. Careful and repeated auscultation failed to detect fœtal heart sounds. The pains lasted for three days, but eventually subsided with sedation and rest. Vaginal loss was practically non-existent. Four days later a plain X-ray examination of the patient's abdomen was made. The film showed the presence of an intact fœtus of about twenty-four weeks. No fœtal abnormality was seen. As neither fœtal heart sounds nor fœtal movements appeared to be present, arrangements were made for the patient to visit the electrocardiography department at Sydney Hospital. Electrodes were placed on the fundal area of the abdomen, in the right and left flanks and suprapubically, with a vaginal electrode in the posterior fornix. The photograph of the tracings, which were shown at the meeting and had been made available by courtesy of the technician in charge, Mr. J. Davis, proved conclusively that the fœtus was alive. The fœtal heart rate was 150 per minute, whilst the maternal rate was 80 per minute. The fœtal and maternal *QRS* complexes could be distinguished in each tracing. After her sojourn in hospital, the patient was discharged from Dr. Sydney Hing's care and eventually carried on to a normal confinement.

Ovarian Hæmorrhage of Uncertain Origin.

Dr. Sydney Hing then showed a young woman, aged twenty-three years, who had been admitted to hospital with a diagnosis of ruptured extrauterine pregnancy. She had complained of lower abdominal pain for the previous two weeks. The pain had become worse and had involved the whole of the abdomen by the time the patient was admitted to hospital. There was also pain in the right shoulder. Her last menstrual period had occurred five weeks earlier, but it had been prolonged and intermittent in character. Examination of the patient revealed tenderness and guarding across the lower part of the abdomen. Vaginal examination showed the presence of a small amount of bright red blood. The uterus was slightly enlarged, and a mass was felt in the right fornix. At operation, the abdomen was found to be filled with blood and blood clot. A small mass was removed from the right ovary and sent to the pathologist. Convalescence was uneventful, and the patient was discharged from hospital well. The pathological report was equivocal. The specimen consisted mostly of blood clot with a few epithelial fragments suggesting remains of an endometrial cyst.

Cyclical Epistaxis Associated with Menorrhagia.

The third case discussed by Dr. Sydney Hing represented an interesting relationship of cyclical nose-bleeding with menstruation since the patient's menarche at the age of thirteen years. The patient, aged thirty-three years, had first consulted Dr. Hing with a complaint of menorrhagia, for which she at first had a curettage. At the end of several months, the floodings having become progressively worse, Dr. Hing decided to perform a total hysterectomy on her. Bilateral salpingo-oophorectomy was carried out at the same time. The pathologist reported that both ovaries were cystic, and that examination of the right tubo-ovarian mass showed the presence of a small follicular cyst with scattered glandular islands of microscopic size, which was in keeping with endometriosis. Examination of the endometrium showed chronic inflammatory changes with glandular endometrial polypi. In view of the patient's persistent epistaxis with each menstrual period, Dr. Hing arranged for a consultation with Dr. Frank Ellis, who reported that there was an area of capillary engorgement in the nasal septum on each side. He concluded that the epistaxis could have been vicarious menstruation, but not truly such. Both areas of the septum were lightly cauterized with trichloracetic acid. Since the operation and the nasal treatment during her convalescence in hospital, the patient had suffered no further epistaxis. It was interesting to note that she gave a history of amenorrhœa previously, when she thought that the nose bleeding might have replaced the menstrual period.

Advanced Cystic Degeneration of Fibromyoma Uteri.

Finally Dr. Sydney Hing showed a patient who had been admitted to hospital with profuse vaginal hæmorrhage two weeks after a normal menstrual period. The uterus was enlarged, and the exsanguination was of such a degree that immediate blood transfusion was instituted. The patient was examined under anæsthesia and her uterus was curetted. Normal endometrium was obtained, and a provisional diagnosis of submucous fibroid tumour was made. The patient came under Dr. Hing's care for operation, and total hysterectomy was carried out. The uterus, which measured five by four by three and a half inches, contained three intramural fibroid tumours. The largest of the tumours was two and a half inches in diameter, and examination showed it to have a completely degenerated centre, which consisted of reddish liquefied material. The condition was one of advanced cystic degeneration of a fibroid tumour with profuse hæmorrhage, presumably following rupture of a vessel into the uterine cavity.

Out of the Past.

In this column will be published from time to time extracts, taken from medical journals, newspapers, official and historical records, diaries and so on, dealing with events connected with the early medical history of Australia.

SNAKES IN THE NEW SETTLEMENT, 1793.[1]

[From "A Complete Account of the Settlement in New South Wales", by Watkin Tench, Captain of Marines.]

REPTILES in the swamps and covers are numerous. Of snakes there are two or three sorts: but whether the bite of any of them be mortal or even venomous is somewhat doubtful. I know but of one well attested instance of a bite being received from a snake. A soldier was bitten so as to draw blood: and the wound healed as a simple incision usually does without shewing any symptom of malignity—a dog was reported to be bitten by a snake and the animal swelled and died in great agony. But I will by no means affirm that the cause of his death was fairly ascertained. It is however certain that the natives shew, on all occasions, the utmost horror of the snake, and will not eat it, although they esteem lizards, guanas and many other reptiles delicious fare. On this occasion they always observe that if the snake bites them, they become lame: but whether by this they mean temporarily or lasting lameness I do not pretend to determine. I have often eaten snakes, and always found them palatable and nutritive, though it was difficult to stew them to a tender state.

Correspondence.

THE RÖNTGEN ORATION.

SIR: Dr. O'Day's letter (May 28, 1955) on the Röntgen Oration shows him an out-of-date unblushing materialist. Does he not know scientists today speak of the great architect of the universe? Does he not know that Einstein taught that matter and energy are interchangeable and inextricably intertwined? This applies to the spiritual and material, too, that Sunday and Monday, laboratory and oratory, are one. Does he know McLeod of Iona? Has he heard of Professor J. B. Rhine, who, in his book "The New World of the Mind", says: "By the application of strict scientific methods it is found there is something operative in man that transcends the laws of matter. The universe differs therefore from what the prevailing materialist concepts indicate. It is a universe about which it is possible to be religious."

To many scientists (Raynor Johnston) men are embryonic spiritual beings. "Knowledge of their divinity has to be won by an age long process of descent into the prison of time and space and a gradual ascent therefrom." So this world is "a vale of soul making", and material factors, so highly valued by the Communists, are the merest incidents. It is the quality of the man or woman who possesses them that is all important. So thanks be to Dr. Darling who described the futility and aimlessness of life for many today. Thanks be to him that he told scientists that the purpose of life was to be like Christ.

[1] From the original in the Mitchell Library, Sydney.

How crude then Dr. O'Day's advice to reject mysticism and cling to science. Why not both? How vague his remarks about what is occurring today! How ignorant and silly, as well as insulting, his rebuke to scientists that "they should be the first to regret the refurbishing of old nonsense".

Yours, etc.,

Mount Eliza, Victoria, June 20, 1955. MARY HAM.

SIR: Science "deals with concepts and abstractions" and "Cartesian dualism is no longer tenable", writes Dr. Langton-Lockton. This means that he asks us to return to the philosophy of Bishop Berkeley, who wrote in 1710: "It is indeed an opinion strangely prevailing amongst men that houses, mountains, rivers and in a word all sensible objects have an existence, natural or real, distinct from their being perceived by the understanding. . . . For what are the forementioned objects but the things we perceive by sense? And what do we perceive but our own ideas or sensations? And is it not plainly repugnant that any one of these, or any combination of them, should exist unperceived?"

In agreement with Berkeley, Dr. Langton-Lockton says science is "wholly intellectual" and is "self-evident". This is idealism, of which by the way existentialism, so dearly loved by the Nazis, is merely a subgroup. It is true that idealism in this century is being revived in many forms. Let Bishop Berkeley tell us why: "Matter being once expelled out of nature drags with it so many sceptical and impious notions, such an incredible number of disputes and puzzling questions which have been thorns in the sides of divines as well as philosophers, and made so much fruitless work for mankind, that if the arguments which we have produced against it are not found equal to demonstration (as to me evidently they seem), yet I am sure all friends of knowledge, peace and religion have reason to wish they were."

To put it shortly idealism is an ideal philosophy for conservatives, but it will not stand examination. Science, acting on the assumption that the mountains, rivers *et cetera* exist independently of thought, that our sensations, concepts and ideas are a reflection of this independent existence, proves the truth of its assumption in practice. As nature is infinite, science, of course, cannot acquire a complete knowledge of it.

That is no new discovery, as Dr. Langton-Lockton says. It is centuries old, and far from limiting science, it offers infinite possibilities of discovery to it. Science says that germs, for example, are real, actual independent things. Dr. Langton-Lockton would have them concepts. Science does not deal with concepts and abstractions. It uses concepts and abstractions to deal with realities. As for religion, it deals with concepts and abstractions that cannot be proved by practice. Dr. Langton-Lockton says religion should be studied. Religion has been well and scientifically studied. It is a human product; its roots are ignorance, fear, misery and class interests.

Many honest people find consolation in religion, and their faith must be treated with respect, but that does not mean that religion can be reconciled with science. Its realm is nescience. Science is daily reducing the dimensions of that realm, and social advances are removing the roots.

Cartesian dualism, which means the combination of idealism and materialism, is, I agree, untenable. Dr. Langton-Lockton would drop materialism. Science, to which Descartes's materialism was such an aid, drops idealism.

I must defend science against Dr. Langton-Lockton's calumnies. Science is not dehumanizing, totalitarian or depersonalizing. Scientific knowledge enables men to help each other understandingly, to control their emotions and direct their actions by true knowledge, the which is clearly the highest form of human activity and sentiment.

Science in the next form of society which man is now adopting will tremendously aid every human being to develop fully his or her personality. Science cannot be totalitarian, for its recognition of its own limitation renders it undogmatic, unauthoritarian. It is for use, not worship. Science does not endorse the maxim "the end fortifies the means". In any action not only the end but all the concomitant circumstances must be considered; for example, to crack a nut by swinging a sledge-hammer in a dining room cannot be justified.

By the way, science would agree that each individual is a unique and unrepeatable entity. But so is each dog, whale, cat, snail and almost certainly each atom. This is merely a recognition of the infinity of nature.

As human beings, social and individual by nature, Dr. Langton-Lockton may possibly agree that we should love, respect and aid each other for reasons that need no appeal to the supernatural and are daily strengthened by science.

Finally, may I say that abuse is no argument. Calling one's opponent naïve, blind, intolerant and subversive lends no force to one's statements.

Yours, etc.,

Melbourne, July 8, 1955. G. P. O'DAY.

M'NAGHTEN OF THE RULES.

SIR: The name M'Naghten is familiar enough in forensic medicine. It is pronounced as if spelt MacNorton. The story of the variants in the spelling of the name has been told recently by Diamond and by Overholser. At the trial the name was spelt M'Naughton; it was also spelt M'Naughten; this was in 1843. In America the forms McNaughton and McNaughten were used later. The name in the records at the Bethlehem Royal Hospital and the Broadmoor Institution is McNaughten. Various authors including Sir Norwood East spelt the name as McNaghten; while another writer used the form M'Naughton. There are at least ten spellings of the name. The forms McNaughton and MacNaughton have been used. The accused spelt his own name McNaughton. The form M'Naghten, however, rightly or wrongly, is the one mostly in use.

Yours, etc.,

New Norfolk, Tasmania, June, 1955. S. J. CANTOR.

References.

DIAMOND, B. L. (1954), *Am. J. Psychiat.*, March, page 705.
OVERHOLSER, W., *ibidem.*

AN UNUSUAL SIDE EFFECT OF "DIGOXIN".

SIR: I feel that the enclosed letter from Messrs. Burroughs Wellcome and Company, London, with the notes herewith of the case, would prove sufficiently interesting to the profession to ask you to publish same.

The patient was a male, aged fifty-four years, an old bronchiectatic, whose main trouble was dyspnœa, especially on walking to the railway station. He was given the usual instructions as to postural drainage, injections of "Bicillin" once weekly, "Terramycin" (0·250 milligramme) twice daily and "Tabloid Digoxin" (0·25 milligramme) one three times daily. After taking "Digoxin" for two weeks he thought that "Digoxin" caused some nausea if taken before meals, but not if taken after meals. As his heart rate continued at 90 per minute and his breathlessness continued, he was given four tablets of "Digoxin" (0·25 milligramme) daily. One month later, while his dyspnœa had improved, he complained of dimness of vision and consulted Dr. D. C. Hinder, of Burwood, an ophthalmic surgeon. Dr. Hinder reported that there was no pathology of the eyes and that the "Digoxin" was possibly the cause of dimness of vision, saying that his confrère, Dr. D. Shortridge, had seen other similar cases.

I had never heard of this side effect and contacted the chief chemist at Messrs. Burroughs Wellcome and Company, Sydney, who also said he had not heard of this effect. He referred the matter to their London office. A letter from the Medical Information Department of that firm is appended hereunder.

I have spoken to some leading physicians in Sydney, and they, too, had not met this unusual side effect.

Yours, etc.,

Pennant Hills, New South Wales, June 17, 1955. CLYDE DAVIS.

Dear Sir,

We have been informed by our Associated House in Sydney of your unfortunate experience in a patient treated with Digoxin.

We very much regret the occurrence of this side effect, but visual disturbances are not rare as a sign of digitalis poisoning.

In a recent paper by Turtz, it is also stated that the usual dosage of digitalis preparations can produce visual symptoms, with little or no evidence of intoxication.

The common visual disturbances are those of colour vision, but transitory amblyopia, diplopia and scotomata may also ensue. It has also been reported that digitalis can affect the fibres of the optic nerve and cause retro-bulbar neuritis.

In one case of retro-bulbar neuritis following digitalis administration, visual acuity was badly impaired (10/200). On examination, the occular fundi appeared normal. Full visual acuity returned five weeks after the withdrawal of digitalis.

It has been suggested that the visual disturbances are due to involvement of the visual cortex of the brain, and represent, therefore, temporary cortical blindness.

These side effects may depend on specific individual susceptibility, and have been noted with various digitalis preparations. To the best of our knowledge no such case has so far been reported from the use of Digoxin.

We shall be pleased to send you any further information you may require in this matter.

Yours faithfully,

J. M. FRISCH, M.R.C.S., L.R.C.P.,
Medical Information Department.

References.

TURTZ, C. A. (1954), "Visual Toxic Symptoms from Digitalis", *Am. J. Ophth.*, 38: 400 (September).

GOODMAN AND GILMAN (1954), The Pharmacological Basis of Therapeutics", Second Edition.

RECENT TRENDS IN THE TREATMENT OF FRACTURES.

SIR: While in hearty agreement with practically everything Mr. Price says (M. J. AUSTRALIA, July 2, 1955), particularly the ideal of all fractures being dealt with in a properly equipped and staffed "fracture service", I want to enter a protest against his dictum *re* the "skin-tight plaster cast"—unless the plaster is split completely. Where the ideal "fracture service" is available, little harm can come from this teaching, within the service, but for the man at some distance from his patient the unsplit skin-tight plaster cast may cause disaster.

I cannot refrain from this criticism of an otherwise excellent article. The danger of the unsplit skin-tight plaster is very real.

Yours, etc.,

JOHN HOETS.

143 Macquarie Street,
Sydney,
July 5, 1955.

POTASSIUM METABOLISM IN GASTRO-ENTERITIS.

SIR: I would like to make a few comments relating to your review on potassium metabolism in gastro-enteritis (May 14, 1955).

There is only a rough correlation between the serum potassium concentration and the status of total body potassium. However, the finding of hypokalæmia is usually most informative, but it is not necessarily a means of classifying the degree of potassium deprivation in the body.

It is stated that "potassium should never be given to dehydrated infants with gastro-enteritis except in the small quantities contained in Hartmann's solution and human plasma". This statement is not in agreement with current views. In almost all cases, following the initial period of intravenous infusion and by the third hour, the patient will pass urine yielding presumptive evidence of adequate renal function. At this time one may administer Darrow's solution or some other replacement solutions containing 40 milliequivalents of potassium per litre and at a rate no greater than half a milliequivalent per kilogram per hour, as previously and carefully described (Cheek, 1954).

In the study by Schlesinger *et alii* (1955) patients with gastro-enteritis received high sodium loads and delayed administration of potassium. The observed symptoms and chemical findings of potassium deficiency were frequent. Recent work (Cheek and West, 1955) demonstrates that if the sodium load to patients with gastro-enteritis does not exceed 12 milliequivalents per kilogram for the first twenty-four hours, together with three milliequivalents of potassium per kilogram per day, then the acid-base balance is rapidly restored. On the other hand, even if the same optimal amounts of potassium are given to a second group of patients together with a high sodium chloride load during the first twenty-four hours (150 cubic centimetres of saline or Hartmann's solution, or more), then the pattern of events described by Schlesinger *et alii* (alkalosis hypokalæmia, œdema *et cetera*) will be approached at seventy-two hours following admission, and in some instances a significant expansion of the chloride space has been found together with cell water subtraction.

In brief, the sodium load that the patient with gastro-enteritis receives is of importance even when optimal amounts of potassium are given. If a high load is infused, the restoration of cell potassium and acid-base balance will be delayed, and an abnormal state of body composition will be induced.

Rats placed on a potassium-deficient diet and subjected to high sodium loads demonstrate a gross disorganization of total body composition.

Yours, etc.,

DONALD B. CHEEK, D.Sc., M.D.

Children's Hospital Research Foundation,
Cincinnati, Ohio,
United States of America.
June 24, 1955.

References.

CHEEK, D. B. (1954), "Fluid and Electrolyte Balance", M. J. AUSTRALIA, 2: 917.

CHEEK, D. B., and WEST, C. D. (1955), "Changes in Total Chloride and the Distribution of Water in Gastro-Enteritis following Treatment with High and Low Sodium Chloride Loads", paper submitted to the Society of Pediatric Research, June 15 to 18, 1955.

SCHLESINGER, B., PAYNE, W., and BLACK, J. (1955), "Potassium Metabolism in Gastroenteritis", *Quart. J. Med.*, 24: 33.

CARCINOMA OF THE STOMACH: A CRITICAL REVIEW.

SIR: Dr. John Smyth in his interesting, if pessimistic, review of carcinoma of the stomach emphasizes certain fallacies in interpreting the results of treatment, and in the process involves himself in others.

The statement that in the past the malignancy of each tumour has been ignored as a crucial factor in prognosis is not altogether true. For example, it is well known, and has long been known, to surgeons and pathologists that there is a small-celled undifferentiated type of carcinoma of the stomach that has an unexpectedly good prognosis.

Much more dangerous, and certainly fallacious, is Dr. Smyth's conclusion that it is open to question whether there is any value in the early diagnosis of carcinoma of the stomach. Admitting it is true that certain carcinomas spread rapidly and a minority slowly, it is surely obvious that, whether growing slow or fast, all will eventually become inoperable, and that the earlier the operation the greater the number of both groups that will be saved. Even though, in the case of rapidly growing carcinomas, the salvage rate may be so small as to be of no interest to the patients, in the case of the small group of slow-growing tumours the percentage cured will obviously rise if all are subjected to radical surgery without any delay. Nor is it to be believed that carcinomas of the stomach fall into two such well-defined groups—the fast-growing and the slow-growing. Many are intermediate in type, and for such it is clear that early and radical treatment must increase the chance of cure.

The risk to the patient of a diagnostic laparotomy is now small, and in suspected carcinoma of the stomach is justified in those early cases when the radiological evidence is equivocal. Whether a patient should be subjected to a heroic attempt to remove completely a carcinoma of doubtful operability, whether a palliative operation should be performed, or whether Nature should be left to take her course are not matters to be decided by ex-cathedra rules based on dubious premises, but on the particular circumstances of each case. For a young patient in good physical condition an attempt at radical cure may well be justified even though the mortality risk be increased; on the other hand, an aged patient may well be abandoned as an operative risk even though there is still a remote possibility of successful removal of the growth.

It would be unfortunate if surgical practice in all centres was reduced to a uniform level of conservatism. Advances in technique that may ultimately salvage lives often in the course of their development result in mortality figures higher than those associated with a cautious selection of cases. On the other hand, it is obviously not justified that surgeons lacking the necessary élan and technique should attempt procedures they are incapable of performing with any reasonable chance of success. If surgery is to advance, the emphasis must, however, be on cure rather than palliation, the latter being reserved only for those cases where the possibility has been eliminated by time and circumstance. In actual practice a patient may often be advised of the alternative merits of an attempt at radical cure that may be dangerous and only carry a small chance of success, and of palliative treatment that is only temporary and may not palliate; but whichever is chosen it is certain that the earlier the diagnosis and the treatment the more likely the operation will be, in its own particular way, of value.

Yours, etc.,

J. ORDE POYNTON, Director.

The Institute of Medical and Veterinary Research,
Frome Road,
Adelaide.
July 8, 1955.

POST-GRADUATE DIPLOMAS FOR THE GENERAL PRACTITIONER.

SIR: Dr. Ferguson's letter proposing post-graduate diplomas for general practitioners (M. J. AUSTRALIA, June 11, 1955) was most interesting. Unfortunately it is only too true that many general practitioners find themselves in a rut and after a few years have forgotten much of their medical knowledge. Most of them no doubt would like to bring themselves up to date, but are prevented from undertaking post-graduate courses by the ties of their practices and in many cases by their living at places remote from the cities.

But surely it is not essential that attendance at specified courses be a prerequisite of diplomas. A suitable body, for instance, the College of General Practitioners, held examinations from time to time, a large number of general practitioners would be able to submit themselves. As long as they satisfied the examining body, it should not matter one whit whether they brought themselves to the required standard by attending courses, or by studying at home and developing their clinical technique in their own practices and perhaps at local hospitals. Certainly post-graduate courses should be attended if at all possible, but there seems no reason why printed lectures on recent advances could not be issued.

For a diploma to be of any value the standard would have to be as high as is consistent with the obvious difficulties *re* time for study *et cetera*. Apart from the value to the community of having competent up-to-date doctors, the doctor himself would have a feeling of great satisfaction in knowing that he was not stagnating. Perhaps a condition of holding the diploma could be that a supplementary examination should be held every few years.

Yours, etc.,

July 7, 1955. "G.P.".

Post-Graduate Work.

THE POST-GRADUATE COMMITTEE IN MEDICINE IN THE UNIVERSITY OF SYDNEY.

Course in Rheumatic Diseases.

THE Post-Graduate Committee in Medicine in the University of Sydney announces that a course in rheumatic diseases will be held from Friday, September 9, to Thursday, September 15, 1955, to coincide with the visit to Sydney of Dr. W. S. C. Copeman, O.B.E., M.D., F.R.C.P., who is physician in charge of the Department of Rheumatic Diseases, West London Hospital, and Chairman of the Empire Rheumatism Council.

The programme will include three lectures by Dr. Copeman and three clinical conferences presented by members of the staffs of the arthritis clinics of the Royal Prince Alfred Hospital, The Royal North Shore Hospital of Sydney and the Royal South Sydney Hospital. Dr. Copeman will comment on the cases after the histories and physical signs have been demonstrated. A detailed programme will be announced shortly. Fees for attendance are £2 2s. for members of the annual subscription course and £3 3s. for non-members. Written application, enclosing remittance, should be made to the Course Secretary, The Post-Graduate Committee in Medicine, 131 Macquarie Street, Sydney, from whom further details may be obtained. Telephones: BU 4497-8. The closing date for applications is September 2, 1955.

Annual Subscription Course.

The Post-Graduate Committee in Medicine in the University of Sydney announces the visit to New South Wales of Sir Stanford Cade, K.B.E., C.B., F.R.C.S., M.R.C.P., Senior Surgeon, Westminster Hospital, London, and member of the Cancer and Radiotherapy Committee of the Ministry of Health, and of Professor Brian Windeyer, F.R.C.S., F.F.R., Director of the Meyerstein Institute of Radiotherapy, Middlesex Hospital, London; they will give the following lectures during the first week of their visit:

Tuesday, August 2, 8.15 p.m., at the Stawell Hall, 145 Macquarie Street, Sydney: Sir Stanford Cade, "The Natural History of Cancer". Wednesday, August 3, 12 noon, at the Maitland Lecture Theatre, Sydney Hospital: Sir Stanford Cade, "Melanotic Sarcoma". Wednesday, August 3, 8.15 p.m., at the Stawell Hall, 145 Macquarie Street, Sydney: Sir Stanford Cade, "Carcinoma of the Maxillary Antrum"; Professor Brian Windeyer, "Naso-Pharyngeal Tumours". Thursday, August 4, 8.15 p.m., the Stawell Hall, 145 Macquarie Street, Sydney: Professor Brian Windeyer, "Carcinoma of the Lung".

THE MELBOURNE MEDICAL POST-GRADUATE COMMITTEE.

PROGRAMME FOR AUGUST, 1955.

Overseas Lecturers.

Dr. T. F. McNair Scott.

Dr. T. F. McNair Scott, Director of Research, Children's Hospital, Philadelphia, United States of America, will give the following lectures:

Friday, August 5: 12.30 p.m., discussion with talk with Clinico-Pathological Society, Royal Melbourne Hospital, on antibiotic therapy; 8.15 p.m., lecture to general practitioners on "Contributions of the Virus Laboratory to Community Health" in Medical Society Hall, Albert Street, East Melbourne.

Monday, August 8: 8.15 p.m., lecture to general practitioners on "Hepatitis" in the Medical Society Hall.

On Monday, Tuesday and Wednesday, August 8, 9 and 10, Dr. Scott will visit the Royal Children's Hospital and take part in demonstrations and discussions on various subjects, including carbohydrate metabolism, viral infection of the central nervous system, rheumatism, nephrosis and blood disorders. At 8 p.m. on Wednesday, August 10, he will speak at the meeting of the Pædiatric Society of Victoria on "Prophylactic Procedures in Common Infectious Diseases".

Professor Robert Platt.

Professor Robert Platt, Professor of Medicine, University of Manchester, will lecture on "Renal Œdema" on Thursday, August 11, at 8.15 p.m. in the Medical Society Hall.

Fees for Attendance.

The fees for attendance at the evening lectures on August 5, 8 and 11 are at the rate of 15s. each, but those who have paid an annual subscription to the Post-Graduate Committee are invited to attend without further charge.

Country Courses.

Swan Hill.

On Saturday, August 6, at Swan Hill, the following lectures will be given: "Cardiac Failure", Dr. Kenneth Grice; "Common Deformities of Childhood", Dr. Brian Keon-Cohen; "Toxæmias of Pregnancy with Special Reference to Diets", Dr. Donald Lawson.

Flinders Naval Depot.

On Wednesday, August 10, at Flinders Naval Depot, there will be a demonstration by Dr. G. R. A. Syme on "Surgery and the Management of Thyroid Disease". This is by arrangement with the Royal Australian Navy.

Ballarat.

On Thursday, August 11, at 8 p.m. at Craig's Hotel, Ballarat, Dr. W. E. King will lecture on "Recent Advances in Gastro-Enterology". Special attention is drawn to the change of date.

Bendigo.

On Friday, August 19, at 8 p.m. at the Base Hospital, Bendigo, Dr. J. W. Johnstone will lecture on "Menorrhagia".

The Australian and New Zealand Association for the Advancement of Science.

Attention is drawn to the meeting of the Australian and New Zealand Association for the Advancement of Science to be held at the University of Melbourne and the Royal Melbourne Hospital from August 17 to 24. Details may be obtained from Mr. Olver, Registrar's Office, University of Melbourne.

REMINDERS FOR SEPTEMBER-OCTOBER.

From September 8 to 12 lectures in psychiatry will be given by Professor D. R. MacCalman, of Leeds, at 8.15 p.m. in the Medical Society Hall.

From September 13 to 15 Sir Stanford Cade, radiotherapist, of London, will visit Melbourne.

From September 17 to October 8 a gynæcology and obstetrics refresher course will be held at the Royal Women's Hospital.

From October 10 to 15 a general refresher course in medicine and surgery will be held. Enrolments for this course should be made as soon as possible, so that the committee will know whether there is sufficient demand for it.

Inquiries.

Inquiries regarding the above courses should be sent to the Melbourne Medical Post-Graduate Committee, 394 Albert Street, East Melbourne. Telephone: FB 2547.

Naval, Military and Air Force.

APPOINTMENTS.

THE following appointments, changes *et cetera* have been promulgated in the *Commonwealth of Australia Gazette*, Number 25 and 26, of June 2 and 9, 1955.

AUSTRALIAN MILITARY FORCES.

Australian Regular Army.

Royal Australian Army Medical Corps (Medical).

F3/423 Captain J. Finney is transferred to the Reserve of Officers (Royal Australian Army Medical Corps (Medical)) (Southern Command), 6th April, 1955.

2/40180 Honorary Captain E. H. Holland is appointed from the Reserve of Officers, and to be Captain, 9th December, 1954, with a Short Service Commission for a period of one year.

Citizen Military Forces.

Eastern Command.

Royal Australian Army Medical Corps (Medical).—To be Captain (provisionally), 15th April, 1955: 2/127051 Ian Henry Edward Dawson.

Southern Command.

Royal Australian Army Medical Corps (Medical).—3/101820 Captain (provisionally) P. Ebeling relinquishes the provisional rank of Captain, and is transferred to the Reserve of Officers (Royal Australian Army Medical Corps (Medical)) (Southern Command) in the honorary rank of Captain, 27th January, 1955. To be Temporary Major, 7th April, 1955: 3/123415 Captain T. J. Walsh.

Central Command.

Royal Australian Army Medical Corps (Medical).—4/32067 Honorary Captain G. L. Mellor is appointed from the Reserve of Officers, and to be Captain (provisionally), 1st April, 1955. The age for retirement of 4/35254 Major R. A. Isenstein is extended until 23rd April, 1956.

DISEASES NOTIFIED IN EACH STATE AND TERRITORY OF AUSTRALIA FOR THE WEEK ENDED JULY 9, 1955.[1]

Disease.	New South Wales.	Victoria.	Queensland.	South Australia.	Western Australia.	Tasmania.	Northern Territory.[2]	Australian Capital Territory.	Australia.[3]
Acute Rheumatism	..	3(2)	4(4)	..	..	..	..	..	7
Amœbiasis	..	1(1)	..	..	..	..	..	..	1
Ancylostomiasis	..	1(1)	15	..	..	..	..	..	16
Anthrax	..	..	..	..	..	..	..	..	..
Bilharziasis	..	..	..	..	..	..	..	..	..
Brucellosis	..	..	..	..	..	..	..	..	..
Cholera	..	..	..	..	..	..	..	..	..
Chorea (St. Vitus)	..	..	..	..	..	..	..	..	..
Dengue	..	..	..	..	..	..	..	..	..
Diarrhœa (Infantile)	2(2)	16(14)	4(3)	..	..	..	..	..	22
Diphtheria	4(2)	4(3)	7(1)	2(2)	17(14)	..	..	..	34
Dysentery (Bacillary)	..	4(3)	1	..	..	1	..	..	6
Encephalitis	..	4(2)	..	..	..	..	..	..	4
Filariasis	..	..	..	..	..	..	..	..	..
Homologous Serum Jaundice	..	..	..	..	..	..	..	..	..
Hydatid	..	..	..	..	1	..	..	..	1
Infective Hepatitis	32(13)	81(51)	..	10(6)	8(5)	1	..	..	132
Lead Poisoning	..	..	..	..	..	..	..	..	..
Leprosy	..	..	..	..	..	..	..	..	..
Leptospirosis	..	..	..	..	..	..	..	..	..
Malaria	..	..	..	..	..	..	..	..	..
Meningococcal Infection	4(2)	2(1)	1	..	..	1	..	..	8
Ophthalmia	..	..	..	..	1	..	..	..	1
Ornithosis	..	..	..	..	..	..	..	..	..
Paratyphoid	..	..	..	..	..	..	..	..	..
Plague	..	..	..	..	..	..	..	..	..
Poliomyelitis	6(2)	1	1(1)	3(1)	1	..	..	..	12
Puerperal Fever	..	1(1)	5	..	1(1)	..	..	..	7
Rubella	..	17(14)	..	3(2)	4(2)	..	..	..	24
Salmonella Infection	..	..	..	..	..	..	..	..	..
Scarlet Fever	11(7)	15(10)	18(1)	6(4)	2(2)	..	..	..	52
Smallpox	..	..	..	..	..	..	..	..	..
Tetanus	..	..	..	..	..	..	..	..	..
Trachoma	..	..	..	..	2(1)	..	..	..	2
Trichinosis	..	..	..	..	..	..	..	..	..
Tuberculosis	54(36)	17(14)	4(2)	5(1)	9(7)	4(1)	..	..	93
Typhoid Fever	..	..	1	..	..	..	..	..	1
Typhus (Flea-, Mite- and Tick-borne)	..	..	2(1)	..	..	..	..	..	2
Typhus (Louse-borne)	..	..	..	..	..	..	..	..	..
Yellow Fever	..	..	..	..	..	..	..	..	..

[1] Figures in parentheses are those for the metropolitan area.

[2] Figures not available.

[3] Figures incomplete owing to absence of returns from Northern Territory.

Reserve Citizen Military Forces.

Royal Australian Army Medical Corps (Medical).

Northern Command.—To be Honorary Major, 20th April, 1955: Captain K. S. Mowatt.

Central Command.—To be Honorary Major, 20th April, 1955: Captain P. G. Jay.

ROYAL AUSTRALIAN AIR FORCE.

Permanent Air Force.

Medical Branch.

The probationary appointment of Flight Lieutenant J. J. Bain (0210563) is confirmed.

Flight Lieutenant (Acting Squadron Leader) A. I. Lane (0210562) ceases to hold the acting rank of Squadron Leader, 4th April, 1955.

The resignation of Flight Lieutenant A. I. Lane (0210562) is accepted, 5th April, 1955.

Air Force Reserve.

Medical Branch.

The following are appointed to a commission with the rank of Flight Lieutenant: James Charles Wassell (277632), 14th February, 1955; Brian Maurice Hoare (257933), 22nd February, 1955; William John Lachlan (268046), 25th February, 1955.

The provisional appointment of the following Pilot Officers is confirmed and they are promoted to the rank of Flight Lieutenant, 30th March, 1955: R. Brummitt (04715), R. N. Munday (04712), C. G. Deland (04761).

The appointment of Flight Lieutenant T. C. Wall (035953) is terminated, 15th March, 1955.

The Royal Australasian College of Physicians.

EXAMINATION FOR MEMBERSHIP.

INTENDING CANDIDATES for the examination for membership of The Royal Australasian College of Physicians to be held in September-October, 1955, are reminded that applications for this examination close on Friday, August 5, 1955. Application forms may be obtained from the Honorary Secretary, 145 Macquarie Street, Sydney.

The written examination will take place in capital cities where candidates are offering on Saturday, September 3. The clinical examination will take place in Melbourne from approximately Monday, October 10, to Thursday, October 13, 1955.

Only those candidates whose answers in the written examination have attained a satisfactory standard will be asked by the Censor-in-Chief to proceed to the clinical examination.

Nominations and Elections.

THE undermentioned has applied for election as a member of the New South Wales Branch of the British Medical Association:

Hanrahan, Edmund Loftus Bede, M.B., B.S., 1940 (Univ. Sydney), 23 Carlton Street, Granville, New South Wales.

The undermentioned have been elected as members of the New South Wales Branch of the British Medical Association: Aitkens, John Manning, M.B., B.S., 1955 (Univ. Sydney); Beveridge, Bruce Robert, M.B., B.S., 1955 (Univ. Sydney); Henderson, Rolla Charles, M.B., B.S., 1955 (Univ. Sydney); McClure, Peter James, M.B., B.S., 1955 (Univ. Sydney); Rodd, John Michael, M.B., B.S., 1955 (Univ. Sydney); Starzecki, Romuald, M.B., B.S., 1955 (Univ. Sydney); Facer, Kenneth James, M.B., B.S., 1954 (Univ. Sydney); Fraser, Ann Dale, M.B., B.S., 1954 (Univ. Sydney); Huxtable, Bernard Ralston, M.B., B.S., 1954 (Univ. Sydney); Walker, Keith Bernard, M.B., B.S., 1951 (Univ. Sydney); Sweeney, Noel Vincent, M.B., B.S., 1953 (Univ. Sydney); Smith, Dermer Evan, M.B., B.S., 1948 (Univ. Sydney); Malecki, Joseph, registered in accordance with the provisions of Section 17 (1) (c) of the *Medical Practitioners Act*, 1938-1953; Vince, John, registered in accordance with the provisions of Section 17 (1) (c) of the *Medical Practitioners Act*, 1938-1953.

The undermentioned has applied for election as a member of the South Australian Branch of the British Medical Association:

Poynton, John Orde, qualified 1930, London, Institute of Medical and Veterinary Science, Frome Road, Adelaide.

The undermentioned have been elected as members of the South Australian Branch of the British Medical Association: Wilson, Pauline Ina, qualified 1954; Edgar, Oscar Patrick, qualified 1955; Shakes, David James, qualified 1955; Lam, Lambert Teck Choon, qualified 1955; Tassie, Gemmel Wilson, qualified 1955; Horvat, Victor, qualified 1955.

Diary for the Month.

AUG. 2.—New South Wales Branch, B.M.A.: Organization and Science Committee.
AUG. 3.—Western Australian Branch, B.M.A.: Branch Council.
AUG. 9.—New South Wales Branch, B.M.A.: Executive and Finance Committee.
AUG. 12.—Tasmanian Branch, B.M.A.: Branch Council.
AUG. 15.—Victorian Branch, B.M.A.: Finance Subcommittee.
AUG. 16.—New South Wales Branch, B.M.A.: Medical Politics Committee.
AUG. 17.—Western Australian Branch, B.M.A.: General Meeting.
AUG. 18.—Victorian Branch, B.M.A.: Executive of Branch Council.

Medical Appointments: Important Notice.

MEDICAL PRACTITIONERS are requested not to apply for any appointment mentioned below without having first communicated with the Honorary Secretary of the Branch concerned, or with the Medical Secretary of the British Medical Association, Tavistock Square, London, W.C.1.

New South Wales Branch (Medical Secretary, 135 Macquarie Street, Sydney): All contract practice appointments in New South Wales.

Queensland Branch (Honorary Secretary, B.M.A. House, 225 Wickham Terrace, Brisbane, B17): Bundaberg Medical Institute. Members accepting LODGE appointments and those desiring to accept appointments to any COUNTRY HOSPITAL or position outside Australia are advised, in their own interests, to submit a copy of their Agreement to the Council before signing.

South Australian Branch (Honorary Secretary, 80 Brougham Place, North Adelaide): All contract practice appointments in South Australia.

Western Australian Branch (Honorary Secretary, 205 Saint George's Terrace, Perth): Norseman Hospital; all contract practice appointments in Western Australia. All government appointments with the exception of those of the Department of Public Health.

Editorial Notices.

MANUSCRIPTS forwarded to the office of this journal cannot under any circumstances be returned. Original articles forwarded for publication are understood to be offered to THE MEDICAL JOURNAL OF AUSTRALIA alone, unless the contrary be stated.

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